30 June 2011

Free Phase Petroleum Hydrocarbon Investigation Report

Former CENCO Refinery 12345 Lakeland Road, Santa Fe Springs, CA

SLIC No. 0318, ID No. 2040071 CAO 97-118

Prepared on Behalf of

Isola Law Group, LLP Lodi, California

Prepared for

Regional Water Quality Control Board Los Angeles Region

Prepared By



I, Michael Barranco, do hereby declare, under penalty of perjury under the laws of the State of California, that I am the Environmental Coordinator for Lakeland Development Company, that I am authorized to attest to the veracity of the information contained in the report described herein, and that the information contained in

Free Phase Petroleum Hydrocarbon Investigation Report, dated June 30,2011

is true and correct, and that this declaration was executed at Lakeland Development, in Santa Fe Springs, California on <u>June 30, 2011</u>.

Signed,

2.1.12-

Michael Barranco

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1. INTRODUCTION

On behalf of Isola Law Group, LLP, Murex Environmental (Murex) has prepared this *Free-Phase Petroleum Hydrocarbon* (FPPH) *Investigation Report* for the Lakeland Development Company (Lakeland) for its former refinery located at 12345 Lakeland Road in Santa Fe Springs, California (site; **Figure 1**).

The Regional Water Quality Control Board, Los Angeles Region (RWQCB) requested a free-phase petroleum hydrocarbon (FPPH) investigation in a letter dated April 3, 2007 to enhance delineation of the FPPH plume. ARCADIS prepared a workplan to conduct a FPPH investigation which was submitted to the RWQCB August 2007. The workplan was subsequently approved. The investigation approach prescribed the use of the Rapid Optical Screening Tool (ROST) to evaluate the presence of FPPH. ARCADIS completed nine of the original 12 proposed locations (three locations were inaccessible on the property of the Metropolitan State Hospital due to construction at that time) and presented the findings to the RWQCB.

In 2010, the RWQCB issued a letter to Lakeland Development Company titled, "Requirements for Subsurface Investigation and Cleanup Pursuant to Cleanup and Abatement Order No 97-118, Former Powerine/CENCO Refinery" (**Appendix A**). Murex submitted a workplan to complete the FPPH investigation titled "Regulatory Update – FPPH Investigation Status," which was approved by the RWQCB in a letter dated February 15, 2011 (**Appendix A**).

This report summarizes the findings of the historical ARCADIS investigation and the more recent work. This report also provides a summary of FPPH investigation methods, results, and findings.

1.1 Purpose

The main objective of the recent FPPH investigation efforts was to complete the assessment conducted by ARCADIS in 2009. The intent of the investigation was to delineate and quantify the amount of FPPH that exists within the soil and groundwater. Historically, FPPH contamination has been measured in monitoring wells on and downgradient of the former CENCO facility.

2. SITE BACKGROUND

Site description, facility operational history, and site geology and hydrogeology are presented in the following subsections.

2.1 Site Description and History

The site is approximately 55 acres in size and is bordered to the north by Florence Avenue, to the south by Lakeland Road, and to the east by Bloomfield Avenue (Figure 1). The Site is bordered on all sides by commercial and industrial properties. The site was operated as an oil refinery from the 1930s until July 1995. Historical aerial photographs indicate that the western portion of the site may have been used for agricultural purposes from approximately 1928 to 1938. Oil-production-related structures such as ponds and aboveground holding tanks may have also been located onsite during these years (Haley & Aldrich, Inc. [Haley & Aldrich], 2005). The refinery is not currently in operation; however, some of the refinery structures remain onsite. These structures are scheduled to be removed prior to the redevelopment of the property for commercial/industrial use.

Previous refining operations included processing crude oil into several grades of fuel including kerosene, leaded gasoline and aviation fuel, unleaded gasoline, jet fuel, high and low-sulfur diesel, fuel oil, and petroleum coke. Soil and groundwater quality beneath and in proximity to the site have been impacted by past site operations. Soil and groundwater investigations are being conducted pursuant to two CAOs (Nos. 85-17 and 97-118) issued by the RWQCB to Powerine Oil Company (CENCO Refining Company) in 1985 and 1997 (Haley & Aldrich, 2005).

2.2 Geology and Hydrogeology

2.2.1 Regional Geology and Hydyrogeology

The site is located within the Santa Fe Springs Plain Subgeomorphic Province of the Los Angeles Coastal Plain at an elevation of approximately 130 to 140 feet (ft) above mean sea level (amsl). This plain is a slightly rolling topographic feature sloping gently to the northeast in the vicinity of the site due to the northwest trending Santa Fe Springs—Coyote Hills anticlinal system. The site is positioned above the southern limb of the Santa Fe Springs Anticline. Petroleum accumulation associated with this anticlinal structure has resulted in substantial oil production in the Santa Fe Springs area. Prominent topographic features in the area include the Puente and Coyote Hills to the northeast, east, and southeast (Figure 1). The San Gabriel River is located approximately 1.75 miles west of the

site and flows from north-northeast to south-southwest (**Figure 1**; Haley & Aldrich, 2005; Versar, 2000).

The Los Angeles Coastal Plain area is a large structural basin that has accumulated thousands of feet of sediments since Miocene time and has been tectonically active. The Los Angeles Coastal Plain generally consists of alluvial materials deposited by the Los Angeles, San Gabriel, and Santa Ana Rivers. The Santa Fe Springs Plain is comprised of the Upper Pleistocene—age Lakewood Formation (California Division of Mines and Geology, 1999). The Lakewood Formation and the underlying San Pedro Formation are folded over the anticlinal dome structure (Haley & Aldrich, 2005; Versar, 2000).

Several regional water-bearing units have been identified within the older alluvial fan and valley deposits of the Lakewood Formation and underlying San Pedro Formation. In the site area, the Lakewood Formation begins at ground surface, ranges from 100 to 180 ft thick, and is composed of three hydrostratigraphic units: 1) the Bellflower Aquiclude (upper unit), 2) the Exposition Aquifer, and 3) the Gage Aquifer. The Exposition and Gage aquifers consist predominantly of sands and fine gravels with discontinuous, thinly bedded silts and clays. These aquifers have an approximate combined thickness of 100 to 150 ft, approximately half of which is saturated (Versar, 2000).

Within the site vicinity, the Bellflower Aquiclude consists of a heterogeneous mixture of clays, silty clays, silts, and extensive interbedded lenses of sandy or gravelly silts and clays and has an estimated thickness between 20 and 40 ft. The major water-bearing unit of interest for this investigation is the Exposition Aquifer (otherwise known as the Artesia Aquifer), the upper water bearing unit of the Lakewood Formation. The Exposition Aquifer is composed of coarse gravel, coarse to fine sand, and interbedded silts and clays with a general southwesterly dip and thickness between 40 and 80 ft. The Exposition Aquifer is separated from the Gage Aquifer by an unnamed aquiclude. Based on boring logs from the installation of monitoring wells MW-14 A/B/B, MW-15 A/B/C, and MW-16 A/B/C, this aquiclude appears prominently between approximately 130 ft bgs to 170 ft bgs (elevation 0 to -40 ft-amsl).

Information for the site area in Santa Fe Springs indicates that the depth to first-encountered groundwater within the Exposition Aquifer ranges from 75 to 90 ft bgs. The Gage Aquifer consists predominantly of sands and fine gravels with an estimated thickness between 30 and 60 ft (Department of Water Resources [DWR], 1961; Versar, 2000; Haley & Aldrich, 2005; DHES, 2006).

2.2.2 Local Geology and Hydrogeology

In the site vicinity, the Santa Fe Springs Plain consists of the late Pleistocene alluvium of the Lakewood Formation. The Lakewood Formation unconformably overlies the lower Pleistocene San Pedro Formation and the Pliocene Pico Formation. The Lakewood Formation consists of interbedded clays, silts, silty sands, and sands representative of stream-type alluvial and floodplain deposits (Versar, 2000). Previous (Haley & Aldrich, 2005, Blasland, Bouck & Lee, Inc. [BBL], 2006; ARCADIS, 2009) subsurface investigations conducted at the site confirm that the lithology is a vertically and laterally heterogeneous mélange of such alluvial deposits. Underlying a surficial veneer of fill and roadbase materials at the site are interbedded alluvial sediments ranging in texture from poorly graded sands through fat clays. In general, the eastern portion of the site contains more coarser-grained sediments (sand and gravel) than the western portion of the site. During 1st quarter 2011 groundwater elevation measurements, there was an increase in groundwater elevation of approximately 2.16 feet, resulting in an approximate groundwater gradient of 0.007 foot per foot.

2.3 Groundwater Monitoring Program

The quarterly groundwater monitoring program currently includes the existing 44 wells and the newly installed 15 wells, as listed in **Table I** and shown on **Figure 2**. These wells include:

- Twenty-two onsite groundwater monitoring wells: MW-101, MW-103, MW-104A, MW-105, MW-201, MW-202, MW-204, MW-205, MW-504, MW-701, MW-702, MW-703, MW-704, MW-705, MW-706, W-9, W-10, W-11, W-12, W-17A, W-17B, and W-17C;
- Twenty-five downgradient offsite groundwater monitoring wells of which:
 - Four are located on the former Lakeland property: MW-501A, MW-502, MW-503B, and MW-707; and
 - Twenty-one are located on the Metropolitan State Hospital (MSH) property:
 MW-600A, MW-601A, MW-603, MW-604, MW-605, MW-606, MW-607,
 MW-708, MW-709, MW-710, MW-711, MW-712, MW-713, MW-714, MW-715, W-14A, W-14B, W-14C, W-15A, W-15B, and W-15C;
- Seven offsite groundwater monitoring wells located to the southeast on the Walker property including: EW-1, W-1, W-3A, W-4, W-16A, W-16B, and W-16C;

- Three offsite groundwater monitoring wells located to the east on the Bloomfield property that include: MW-106A, MW-107A, and MW-203; and
- Two onsite deep former water production wells identified as W-7 and W-8.

All monitoring wells are gauged in one day prior to purging. The well purging is performed using a vacuum stinger that is connected to a truck mounted vacuum with the exception of wells with FPPH. During purging, extracted groundwater volume and quality are monitored in the field for flow rate, temperature, pH, turbidity, electrical conductivity, dissolved oxygen (DO), oxidation-reduction potential (ORP), color, and odor.

2.4 Local Groundwater Elevation Trend

Groundwater surface elevations were calculated for each well by subtracting the water level measurement from the top of casing elevation (**Table II**). Groundwater elevations were adjusted for wells containing FPPH, assumed to have a relative density of 0.80, which is typical for mean density of various petroleum hydrocarbon mixtures. Groundwater elevations, contour lines, flow direction and gradient are shown on **Figure 2**.

Based on groundwater level measurements obtained on January 28, 2011, first-encountered groundwater beneath the site vicinity ranges in elevation from 11.32 to 50.43 feet above mean sea level (ft-amsl), a slightly higher range than in the previous quarter. Groundwater elevations have exhibited both increases and decreases since previous measurements taken in October 2010, likely attributable to higher than average precipitation during the winter season. The increases, the first to occur for several years, were minor in shallow wells (less than 1.0 foot in wells W-10, W-11, W-15A, MW-104A, etc.) and were significant in deeper wells (7 to 10 feet in wells W-16B, W-16C, W-17B, and W-17C). These wells exhibiting the most significant increases were also the wells exhibiting the most significant decreases during the previous reporting period, indicating that there is likely influence from municipal pumping operations that most strongly affects wells that are more deeply screened, and that the influence originates from the northeast. Most likely, one or more pumping wells was recently deactivated as water demand decreased during the rainy season.

As a whole, the average change in groundwater elevation since the fourth quarter 2010 over all wells measured was an increase of 2.16 feet.

The average horizontal groundwater gradient is approximately 0.007 foot per foot (ft/ft), as shown in **Figure 2**, which is an increase since the previous monitoring period, and represents what is considered a moderately steep gradient. The groundwater flow direction originates from the northeast and turns south across the area of study. This flow direction is relatively consistent with those historically reported in previous investigations.

3. FPPH INVESTIGATION

The following section describes the previous FPPH investigation performed by Arcadis between 2005 and 2009 and the recent activities performed by Murex to complete the investigation.

3.1 Previous FPPH Investigations

FPPH was first detected in well MW-504, on June of 1988, with approximately 1.83 feet of thickness. Between that discovery and the year 2007, FPPH was measured in 18 other wells including: MW-101, MW-103, MW-104, MW-201, MW-202, MW-203, MW-204, MW-205, MW-206, MW-501, MW-502, MW-503, MW-504, MW-600, MW-600A, MW-601, MW-601A, W-3A, AND EW-1. These wells are colored red on **Figure 3**.

Hydrocarbon recovery was implemented over a period of several years: MW-504 was first being treated between 1988 and 1990; MW-501 and MW-502 received treatment between 1990 and 1991. Later, ARCADIS implemented passive hydrocarbon recovery between 2005 and 2009 on wells EW-1, MW-504, MW-600A, AND W-3A (ARCADIS, 2009).

In 2007, ARCADIS prepared a workplan to conduct a FPPH investigation and enhance FPPH plume delineation in response to a letter from the RWQCB dated April 3, 2007. The workplan was submitted to the RWQCB on August 31, 2007 and approved on February 11, 2008 (**Appendix A**). ROST was proposed as the method for measuring FPPH presence on-Site and on properties located downgradient of the Site.

The implementation of ARCADIS' workplan included the following:

- ARCADIS mobilized to the Site on February 21, 2008, and conducted 3 of the planned ROST locations [FPB-02, FPB-05, and FPB-07]. FPB-05 and -07 were completed, however, they struck refusal at a depth of 70 feet below ground surface (ft-bgs) while advancing FPB-02. The locations of the ROST borings are shown in Figure 3.
- Based on the results of the February 2008 work, as well as the results of ongoing soil borings and investigation activities on Site, ARCADIS requested a modification to the August 31, 2007 workplan in a letter dated July 8, 2009 (see Appendix A). FPPH borings FPB-03, FPB-04, and FPB-08 were relocated due to access issues. The proposed changes were approved by the RWQCB on July 9, 2009 by email.

ARCADIS mobilized to the Site during the week of July 22, 2009 and advanced 9 more FPPH borings [FPB-01, -03/03A, -04/04R, -06, -08, -12, and 13]. The locations for FPPH borings FPB-09, -10, and -11 were not accessible at the time due to construction on the State Hospital property. The locations of the ROST borings are shown on Figure 3.

A report of findings was not submitted at that time, as it was ARCADIS' intention to complete the remaining ROST locations after construction on the Hospital property was complete.

3.2 Current FPPH Investigation

On July 21, 2010, the RWQCB issued an order letter to Lakeland to provide an update on the FPPH investigation and a schedule for its completion. Murex Environmental submitted to the RWQCB, on behalf of Lakeland, the *Free Phase Petroleum Hydrocarbon Investigation Status Report*, dated September 3, 2010. Included with the report was an Addendum to the FPPH Work Plan, previously approved on January 11, 2008. This FPPH Work Plan Addendum proposed to perform continuous coring during well replacement installations, to complete the ROST investigation and reposition FPB-09, and perform a FPPH bail down test on wells exhibiting product.. The FPPH Work Plan Addendum was approved on February 15, 2011 (Appendix A).

3.2.1 Visual Inspection of Soil Cores

Due to the significant drop in groundwater elevation over several years, as discussed above, Lakeland installed fifteen new monitoring wells to replace nineteen wells around the site vicinity that had gone dry. During drilling, deep vadose zone and aquifer soils were examined for the presence of FPPH. Core soil samples were examined for the visual presence of LNAPL, and screened using a PID at wells located within and in the proximity of the suspected free phase hydrocarbon area,. The PID readings and soil core observations are summarized in **Table III**.

3.2.2 Rapid Optical Screen Tool (ROST)

ROST technology is capable of providing real-time data collection while penetrating the soil. Cone penetration testing (CPT), which provides real-time stratigraphic data, was also performed simultaneously with each ROST test. Through a sapphire window on the side of the CPT probe, a laser is pulsed through fiber optic cables. When petroleum hydrocarbons are in the soil, the laser causes a florescence against the petroleum. Sensors in a second fiber optic cable record the degree of florescence (measured as a percentage). The intensity of the glow is proportional to the concentration of petroleum hydrocarbons, allowing ROST technology to delineate the affected area (Fugro Geosciences).

Three locations, Free Phase Boring (FPB)-09, FPB-10, and FPB-12, as well as two contingency locations, FPB-14 and FPB-15, were selected and marked. All of these points were located on the Norwalk Metropolitan State Hospital property. Prior to drilling, each survey location was identified for inspection by Underground Services Alert, and was later surveyed by a private utility location service.

For benchmark comparison purposes, FPPH samples taken from wells W-11, EW-1, MW-503B, and MW-708 were collected and delivered to the Fugro Geosciences office in Santa Fe Springs, California, to test their fluorescence response in pure form, and in a laboratory setting. The fluorescence response percentage ranged from approximately 48% to 206% as shown in **Table IV** and **Appendix B**. Also, **Table IV** presents photographs of the FPPH samples. These laboratory tests confirmed that:

- FPPH material taken from monitoring wells at the Site will fluoresce; and
- The resulting fluorescence from encountering the FPPH at the Site registers a significant and easily recognizable response from the equipment.

As a result, it can be concluded that if FPPH is encountered in the subsurface, the ROST would sense its presence.

During the implementation of the ROST activities, difficult drilling conditions were encountered, and as a result, all five of the marked and pre-cleared ROST survey locations were attempted. The locations of the historic ARCADIS ROST points and the recent Murex ROST points are shown on **Figure 3**. The following section discusses the results of the ROST investigation. A summary of the results is listed in **Table V**.

3.2.3 Bail-Down Test

FPPH measurements were conducted prior to the first quarter 2011 groundwater sampling (baseline measurement) using a Solinst Oil/Water Interface Meter. Wells that initially exhibit the presence of FPPH were purged until they become dry (i.e., "bailed-down") or until approximately 10 well volumes were evacuated. Thereafter, the wells were inspected for the return of FPPH. The thickness of the FPPH was measured over longer and longer time intervals (1 hour, 2 hours, 4 hours, 24 hours, 2 days, 4 days, and 7 days).

For wells in which FPPH does not return within the first day, groundwater is sampled for analysis. For wells in which FPPH did return, the rate at which the material returned was

monitored and recorded (see **Table VI**). The intent of this test is to determine the theoretical yield of product recovery, if it were to be initiated in that well. By calculating the theoretical yield, conclusions can be drawn regarding the extent of FPPH impact in the surrounding formation.

4.0 RESULTS AND FINDINGS

4.1 Visual Inspection of Soil Cores

During the installation of monitoring wells located in the vicinity of historical FPPH measurements, continuous core sampling was performed between 80 and 130 ft bgs. This included wells MW-701, 702, 703, 704, 707, and 708.

Inspection and analysis of the cores yielded no visible free product or sheen. However, soil samples collected from well MW-704 at the 120 to 124 feet bgs were observed to have staining. Soil samples from wells MW-707 and MW-708 exhibited elevated PID concentrations, greater than instrument maximum detection of 2,000 ppm, starting in the capillary zone (about 20 feet above the water table and extending to about 10 feet below the water table (see **Table III**). In addition, strong hydrocarbon odors were also noted by the field personnel on the boring logs, which are included in **Appendix C**.

4.2 ROST Results

The ROST investigation was implemented in February 2008, July 2009, and March 2011 by attempting to advance ROST borings into the groundwater table in areas where monitoring wells have historically exhibited FPPH. The data collected is summarized in **Table V** and the ROST fluorescence response plots are provided in **Appendix D**. **Figure 3** shows the locations of the ROST borings.

Some of the ROST boring results indicated the presence of petroleum hydrocarbon compounds; however, not in the form of free product. The ROST identified only horizons of petroleum smearing within the unsaturated zone above the groundwater table (aka "capillary fringe").

The following is a summary of the major findings:

- The ROST did not detect the presence of free product in any of the 16 attempted FPPH borings.
- The results indicate the presence of a smear zone at FPB-03 between 85 and 105 feet bgs. The smear zone most likely was created as a result of the drop in groundwater elevation measured over the last several years.

- ROST Boring FPB-04R indicated the presence of higher carbon chain (i.e. crude oil) at the depth interval of 10 to 50 feet bgs.
- When the ROST probe was able to reach groundwater table, lighter hydrocarbon compounds were consistently measured near the groundwater table (present as a smear zone and not as a free product); the fluorescence intensity was highest at ROST FPB-03;
- Heavier hydrocarbon compounds were consistently detected in shallower soils in the unsaturated zone;
- The CPT results at FPB-04R are consistent with the lithology identified during the soil investigation phases. The lithology for the offsite boring (FPB-08R, FPB-9A) is also similar to the onsite lithology in the south-western portion of the site.

ROST Borings FPB-02, FPB-03, FBP-09, FPB-12, FBP-15, and FPB-15A hit refusal at depths ranging from 56 feet to 85 feet. Where refusal occurred, the soil appears to cause more friction between 40 and 60 feet bgs. In general, detection of impacted soil in the unsaturated zone using ROST was consistent with the results achieved during the discrete soil sampling method used as a part of the Site investigation.

4.3 Bail-Down Test

Measureable free product was identified in four wells: W-11, EW-1, MW-503B, and MW-708. Free product was not detected in wells MW-704, MW-707, or MW-711, despite their position and proximity to wells historically exhibiting free product. In addition, after being purged, free product did not return to well W-11 for almost 2 weeks. The FPPH thickness measured in the four wells ranged from 0.13 to 0.69 feet. The bail-down measurements are listed in **Table VI**.

As shown in the photos accompanying the FPPH fluorescence test results in Table IV, the FPPH samples varied largely in appearance. The FPPH in well MW-708 is particularly pronounced, containing a murky grey, emulsified layer between the silty water and the FPPH layer on top (this could be the result of well development; well surging may have created an emulsion of silty water and petroleum). Well MW-503B contains a thick, oily brown FPPH layer that appears weathered. Well EW-1 contains thick, brown and emulsified petroleum product that is nearly black in color. By comparison, well W-11 contains a translucent, brightly colored yellow petroleum material.

The bail down testing for Well MW-503B resulted in an estimate for free product recovery rate on the order of a small fraction of a gallon per day (0.16 gal/day). The maximum thickness of free product in Well MW-503B was measured at 0.50 feet after three days and did not increase one week later. This behavior is displayed in graphical form in **Figure 4**.

4.4 Groundwater Elevation Trend & FPPH Migration

Based on the groundwater level measurements taken during the first quarter 2011, first-encountered groundwater beneath the Site vicinity ranges in elevation from about 12 to 50 feet above mean sea level (ft-amsl). Groundwater elevations have dropped by an average of approximately 4 feet since January 2009, compared to a decrease of approximately 3.6 feet between February 2008 and January 2009. Murex has reviewed the groundwater elevations measured since groundwater monitoring started in 1988, which indicates that the groundwater elevation has dropped on the order of 20 to 25 feet over that time period in many on- and off-Site wells. Regionally, groundwater elevations have decreased as a result of California's drought and possible municipal groundwater pumping operations.

Along with falling groundwater, FPPH drops as well. This effect causes FPPH to be redistributed in the subsurface at a rate based on relative permeability (the ratio of effective permeability of the medium to a fluid at a specified saturation and the permeability of the medium to the fluid at 100% saturation), capillary pressure, petroleum hydrocarbon chemical characteristics (e.g. solubility), physical characteristics (e.g. viscosity), wettability (tendency of a fluid to spread on or adhere to a solid surface), saturation, and residual saturation of the free product.

Our observations indicate that FPPH migrates further downward in the vadose zone (towards the new, lower water table) by displacing water from the pores of the soil matrix at a rate slower than the falling groundwater level. This migration route can take place when FPPH head is sufficient to displace water with increasing depths, since soil moisture saturation increases in the direction of the water table. Since the amount of FPPH is not increasing in the vadose zone (no new releases), the FPPH head may not increase sufficiently to allow further down-gradient migration or a downward migration rate similar to the water table drop rate. As a result, the FPPH stays, for the most part, above the water table with limited/slow lateral and vertical movement.

The end result of this phenomenon is the very slow introduction of FPPH into groundwater at rates not conducive to traditional recovery techniques. It is likely that the residual FPPH can be effectively addressed through bioventing, air sparging, and/or soil vapor extraction.

5.0 CONCLUSION

FPPH investigations were performed at the former CENCO facility in Santa Fe Springs, California using visual soil core inspection, ROST, and bail-down recovery testing. Results from the visual inspections and ROST investigations did not indicate the presence of free product despite a clear indication of FPPH during well gauging. Furthermore, the bail-down testing resulted in a very low recovery rate. As a result, Murex concludes that free phase petroleum hydrocarbon is present in the subsurface beneath and down-gradient of the former CENCO facility (see **Figure 3**), however, the majority of it is suspended in the unsaturated and capillary fringe zones. It is likely that the ability of the FPPH to leach into the groundwater will continue to dissipate over time as the material biodegrades. Strong evidence of biodegradation, such as high methane concentrations in soil gas, indicate that this effect is occurring.

6.0 CLOSING

I certify under penalty of law that this document and all enclosures were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. The information contained herein is, to the best of my knowledge and belief, true, accurate and complete, however, is reliant upon public agency records, which could be incomplete or inaccurate beyond our control.

Should you have any questions or concerns regarding the material herein, please do not hesitate to contact the undersigned at (714) 508-0800.

Sincerely,

MUREX ENVIRONMENTAL, IN

Jeremy R Squire, PE

Senior Engineer

Paris Hajali, Ph.D., P.E.

Principal

7.0 REFERENCES

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Table I
Well Construction Details
Former CENCO Refinery
Santa Fe Springs, CA

	W	/ell Installation										Completion	n Data									
			Ele	vation ¹			S	creen			Dept	th (ft)					Elevat	ion¹ (ft)				
Well ID	Date	Ву	Ground Surface	Top of Casing	Hole Diameter (in)	Casing Diameter (in)	Slot	Length	San	d Pack	1	otted	Total	Depth	San	d Pack		otted	Total	Depth	Location	Reference(s)
			(ft)	(ft amsl)	- (,	Diameter (m)	(in)	(ft)	Тор	Bottom	Тор	Bottom	Casing	Hole	Тор	Bottom	Тор	Bottom	Casing	Hole		
Groundwater N	Nonitoring Wells	•		•			•				•	•			•							
EW-1	6/11/1905	Emcon	146.85	146.85	-	4	-	-	-	-	-	-	113.5	-	-	-	-	-	-	-	Walker	Versar (2000)
MW-101	8/28/1985	IT	145.19	138.00	12	4	-	20	69.5	90	70	90	90	95	66	45	65	45	45	40	Refinery	IT (1986); Versar (2000); ARCADIS (2003)
MW-103	8/30/1985	IT	137.18	139.36	12	4	-	20	-	-	79	99	99	99.5	-	-	58	38	-	37	Refinery	IT (1986); Versar (2000); ARCADIS (2003)
MW-104	8/24/1985	IT	-	-	12	4	-	20	-	-	76.5	96.5	97	99	-	-	66	46	-	43	Refinery	IT (1986); Versar (2000); ARCADIS (2003)
MW-104A	6/1999	Versar	142.38	144.13	-	4	-	-	-	-	65	100	100	-	-	-	-	-	-	-	Refinery	Versar (2000); measured well depth
MW-105	12/1995	TriHydro		141.16	-	4	-	-	-	-	68	98	98	100	-	-	-	-	-	39	Refinery	Versar (2000); measured well depth
MW-106	12/1995	TriHydro	-	-	-	4	-	-	-	-	74	104	106.45	106	-	-	-	-	42	42	Bloomfield	Versar (2000)
MW-106A	2/20/2006	N&M	152.92	152.81	8	4	0 02	27	82	110	83	110	110	110	70	42	69	42	42	42	Bloomfield	Well completion report
MW-107	12/1995	TriHydro	-	-	-	4	-	-	-	-	75	105	107.55	108	-	-	-	-	41	41	Bloomfield	Versar (2000)
MW-107A	2/20/2006	N&M	147.37	147.02	8	4	0 02	27	82	110	83	110	110	110	64	36	63	36	36	36	Bloomfield	Well completion report
MW-201	9/10/1985	IT	134.86	135.65	12	4	-	30	66	103	72	102	102	103	67	30	61	31	31	30	Refinery	IT (1986); Versar (2000); ARCADIS (2003)
MW-202	9/23/1985	IT	139.00*	140.62	16	4	-	30	58	105	63	93	93	105	70	23	65	35	35	23	Refinery	IT (1986); Versar (2000); ARCADIS (2003)
MW-203	9/13/1985	IT	144.08	143.71	12	4	-	30	64.7	107	77	107	107	119	78	36	66	36	36	24	Bloomfield	IT (1986); Versar (2000); ARCADIS (2003)
MW-204	9/19/1985	IT	141.15	142.90	12	4	-	30	67.5	105	73.3	103.3	103.3	105	73	35	67	37	37	35	Refinery	IT (1986); Versar (2000); ARCADIS (2003)
MW-205	9/14/1985	IT	140.00*	140.09	12	4	-	30	65.5	103	69.5	99.5	99.5	104 5	73	35	69	39	39	34	Refinery	IT (1986); Versar (2000); ARCADIS (2003)
MW-206 ²	9/18/1985	IT	-	-	-	4	-	30	62.5	104	71	101	101	104	67	26	59	29	29	26	Lakeland	IT (1986); Versar (2000); ARCADIS (2003)
MW-501	6/9/1986	IT	-	-	_	4	-	30	-	_	71	101	101	107	-	-	58	28	-	22	Lakeland	IT (1986); Versar (2000); ARCADIS (2003)
MW-501A	3/1999	ATC	131.26	130.89	_	4	-	-	-	_	75	95	95	95	-	-	-	_	-	35	Lakeland	Versar (2000); measured well depth
MW-502	6/11/1986	IT	131.88	131.00	_	4	_	30	_	-	74	104	104	104	-	_	54	24	_	24	Lakeland	IT (1986); Versar (2000); ARCADIS (2003)
MW-503	6/13/1986	IT	-	-	_	4	-	30	-	-	80.5	110.5	110.5	111	-	_	51	21	-	20	Lakeland	IT (1986); Versar (2000); ARCADIS (2003)
MW-503B	1/1999	Versar	133.03	132.66	_	4	_	_	_	_	69	109	109	109	-	_	-	_	-	21	Lakeland	Versar (2000); measured well depth
MW-504	6/18/1986	IT	-	137.18	_	4	_	50	_	-	58	118	95.76	118	-	_	77	17	_	17	Refinery	IT (1986); Versar (2000); ARCADIS (2003)
MW-600	8/15/1990	ENSR	-	-	_	4	_	30	_	-	78	108	108	110	-	_	42	12	_	10	MSH	IT (1986); Versar (2000); ARCADIS (2003)
MW-600A	6/1999	Versar	123.28	124.26	_	4	_	-	-	_	_	-	92.7	100	_	_	-	_	_	20	MSH	Versar (2000); measured well depth
MW-601	8/17/1990	ENSR	-	-	_	4	_	30	_	-	85	115	115	117	-	_	40	10	_	8	MSH	IT (1986); Versar (2000); ARCADIS (2003)
MW-601A	6/1999	Versar			_	4	_	-	_	_	65	100	100	100	_	_	-	-	_	27	MSH	Versar (2000); measured well depth
MW-603	12/1995	TriHydro	121.40	120.95	_	4	_	_	_	_	70	100	100	100	_	_	_	_	_	19	MSH	Versar (2000); measured well depth
MW-604	12/1995	TriHydro	140.52	140.07	_	4	_	_	_	_	73	103	103	103	_	_	_	_	_	35	MSH	Versar (2000); measured well depth
MW-605	12/1995	TriHydro	117.40	116.82	_	4	<u> </u>	_	_	_	65	95	95	95		_	_	_	_	20	MSH	Versar (2000); measured well depth
MW-606	12/1995	TriHydro	116.90	116.06	_	4	_	_	_	-	70	100	100	100	-	_	-	_	_	14	MSH	Versar (2000); measured well depth
MW-607	12/1995	TriHydro	128.92	128.28	_	4	_	_	_	_	77	107	107	107	_	_	-	_	_	19	MSH	Versar (2000); measured well depth
W-1	12/1995	TRC	145.19	144.81	_	4	_	_		_	70	129	129	130	_	-	-	_	_	13	Walker	IT (1986); Versar (2000)
W-2 ²	12/1995	TRC	-	144.01	_	4	_	_	-		84	129	129	129	_	_	-	_	_	- 13	Walker	IT (1986); Versar (2000)
W-3 ²	12/1995	TRC	-	_	<u> </u>	4	_	_	_	_	82	122	129	124	_	_	-	_	_	_	Walker	IT (1986); Versar (2000)
W-3A	-	-	137.18	136.79	_	4	_	_	-		-	-	111.52	115	-	_	-	-	_	21	Walker	Versar (2000)
W-4	12/1995	TRC	143.18	142.56	_	4	_	20	_	_	580	600	609	-	_	_	-	_	_	-	Walker	IT (1986); Versar (2000)
W-9	8/22/2006	TA	140.37	139.84	8	2	0 01	35	73	111	75	110	110	120 5	66	28	64	29	29	19	Refinery	ARCADIS BBL (2006)
W-10	8/21/2006	TA	141.39	140.71	8	2	0 01	35	73	111	75	110	110	130	67	29	65	30	30	10	Refinery	ARCADIS BBL (2006)
W-10	8/25/2006	TA	141.39	140.71	8	2	0 01	35	73	111	75	110	110	119	68	30	66	31	31	22	Refinery	ARCADIS BBL (2006)
W-11	8/23/2006	TA	141.96	142.10	0	2	0 01	35	75 75	111	75		110	120 5	69	30	69	30	30	24	Refinery	ARCADIS BBL (2006)
AA-T7	0/23/2000	I IA	142.93	145.15	δ	2	0.01	35	/5	114	/5	114	114	120 5	09	30	69	30	30	24	пеннегу	ANCADIS BBL (2000)

Table I
Well Construction Details
Former CENCO Refinery
Santa Fe Springs, CA

	W	ell Installation										Completion	n Data									
			Elev	ration ¹			Sc	creen			Dept	h (ft)					Elevat	ion¹ (ft)				
Well ID	Date	Ву	Ground Surface	Top of Casing	Hole Diameter (in)	Casing Diameter (in)	Slot	Length	San	ıd Pack	Slo	otted	Total I	Depth	San	nd Pack	SI	otted	Total I	Depth	Location	Reference(s)
			(ft)	(ft amsl)			(in)	(ft)	Тор	Bottom	Тор	Bottom	Casing	Hole	Тор	Bottom	Тор	Bottom	Casing	Hole		
W-14A	. / /		115.23	114.71	9	2	0 02	45	67	112	67	112	112	200	48	3	48	3	3	-85		
W-14B	1/22/2008- 1/30/2008	Arcadis	115.00*	114.78	9	2	0 02	10	157	167	157	167	167	200	-42	-52	-42	-52	-52	-85	MSH	ARCADIS (2008)
W-14C	1,50,2000		115.00*	114.78	9	2	0 02	10	185	195	185	195	195	200	-70	-80	-70	-80	-80	-85		
W-15A	44/27/2007		127.91	127.59	10	2	0 02	45	78	126	80	125	125	200	50	2	48	3	3	-72		
W-15B	11/27/2007- 12/10/2007	Arcadis	128.00*	127.61	10	2	0 02	10	143	156	145	155	155	200	-15	-28	-17	-27	-27	-72	MSH	ARCADIS (2008)
W-15C	, .,		128.00*	127.59	10	2	0 02	10	188	200	190	200	200	200	-60	-72	-62	-72	-72	-72		
W-16A	10/24/2007		147.89	147.60	10	2	0 02	45	76	125	78	123	123	200	72	23	70	25	25	-52		
W-16B	10/24/2007- 10/30/2007	Arcadis	148.00*	147.68	10	2	0 02	10	143	156	152	162	162	200	5	-8	-4	-14	-14	-52	Walker	ARCADIS (2008)
W-16C			148.00*	147.67	10	2	0 02	10	184	200	186	196	196	200	-36	-52	-38	-48	-48	-52		
W-17A	1/31/2008-		141.60	141.38	9	2	0 02	45	63	108	63	108	108	200	78	33	78	33	33	-59		
W-17B	2/8/2008	Arcadis	142.00*	141.37	9	2	0 02	10	159	169	159	169	169	200	-18	-28	-18	-28	-28	-59	Refinery	ARCADIS (2008)
W-17C	2/0/2000		142.00*	141.38	9	2	0 02	10	190	200	190	200	200	200	-49	-59	-49	-59	-59	-59		
MW-701	12/6/2010	Murex	136.87	139.48	12	4	0 02	50	77	130	80	130	130	130	59.87	6 87	56.87	6.87	6.87	6.87	Refinery	Murex (2011)
MW-702	12/15/2010	Murex	140.90	140.12	12	4	0 02	50	77	130	80	130	130	130	63.90	10.90	60.90	10.90	10.90	10.90	Refinery	Murex (2011)
MW-703	12/10/2010	Murex	134.73	137.23	12	4	0 02	50	77	130	80	130	130	130	57.73	4.73	54.73	4.73	4.73	4.73	Refinery	Murex (2011)
MW-704	12/14/2010	Murex	137.93	137.66	12	4	0 02	50	77	130	80	130	130	130	60.93	7 93	57.93	7.93	7.93	7.93	Refinery	Murex (2011)
MW-705	12/13/2010	Murex	139.16	141.94	12	4	0 02	50	77	130	80	130	130	130	62.16	9.16	59.16	9.16	9.16	9.16	Refinery	Murex (2011)
MW-706	12/9/2010	Murex	139.68	139.30	12	4	0 02	50	77	130	80	130	130	130	62.68	9.68	59.68	9.68	9.68	9.68	Refinery	Murex (2011)
MW-707	12/23/2010	Murex	128.86	128.43	12	4	0 02	50	77	130	80	130	130	130	51.86	-1.14	48.86	-1.14	-1.14	-1.14	Getty Drive	Murex (2011)
MW-708	1/12/2011	Murex	126.73	126.26	12	4	0 02	50	77	130	80	130	130	130	49.73	-3 27	46.73	-3.27	-3.27	-3.27	MSH	Murex (2011)
MW-709	1/26/2011	Murex	140.48	139.78	12	4	0 02	50	77	130	80	130	130	130	63.48	10.48	60.48	10.48	10.48	10.48	MSH	Murex (2011)
MW-710	1/13/2011	Murex	122.15	121.99	12	4	0 02	50	77	130	80	130	130	130	45.15	-7 85	42.15	-7.85	-7.85	-7.85	MSH	Murex (2011)
MW-711	1/17/2011	Murex	128.09	127.84	12	4	0 02	50	77	130	80	130	130	130	51.09	-1 91	48.09	-1.91	-1.91	-1.91	MSH	Murex (2011)
MW-712	1/24/2011	Murex	123.57	123.31	12	4	0 02	50	77	130	80	130	130	130	46.57	-6.43	43.57	-6.43	-6.43	-6.43	MSH	Murex (2011)
MW-713	1/19/2011	Murex	128.42	128.15	12	4	0 02	50	77	130	80	130	130	130	51.42	-1 58	48.42	-1.58	-1.58	-1.58	MSH	Murex (2011)
MW-714	1/20/2011	Murex	129.07	128.87	12	4	0 02	50	77	130	80	130	130	130	52.07	-0 93	49.07	-0.93	-0.93	-0.93	MSH	Murex (2011)
MW-715	1/27/2011	Murex	116.66	116.22	12	4	0 02	50	77	130	80	130	130	130	39.66	-13 34	36.66	-13.34	-13.34	-13.34	MSH	Murex (2011)
Groundwater I	Production Wells		1	1		1	, ,	-			1		, ,		r	•	1		, ,		,	
					-	-	-	80	-	-	450	530	690	-	-	-	-	-	-	-	Refinery	У
W-7	-		-	141.97	-	-	-	90	-	-	600	690	-	-	-	-	-	-	-	-	Refinery	IT (1986)
W-8	-		-	141.11	-	-	-	-	-	-	-	-	994	-	-	-	-	-	-	-	Refinery	

NOTES:

Sources: IT, 1986; Versar, 2000; Arcadis, 2003, 2006, 2008, and 2009; Dan Herlihy Environmental Services, 2006 (as shown).

²Well abandoned

ft Feet

in Inches

MSH Metropolitan State Hospital Property

amsl Above mean sea level

TA Test America Drilling

TOC Top of casing

* Value retrieved from Google Earth

¹Survey by BLC Surveying and BBL, Inc. Benchmark No. 13-15290 City of Los Angeles

Table II Summary of Groundwater Level Measurements - Q1 2011 Former CENCO Refinery Santa Fe Springs, CA

Well ID	Date	Total Depth	Depth to	Depth To	FPPH	Top of Casing	Groundwater
			Groundwater	FPPH	Thickness	Elevation	Elevation
		(ft)	(ft)	(ft)	(ft)	(ft amsl)	(ft amsl)
EW-1	1/28/2011	113.00	105.98	105.54	0.44	144.78	39.15
W-1	1/28/2011	129.61	111.71		0.00	144.81	33.10
W-3A	1/28/2011	111.73	DRY		0.00	136.79	NA
W-4	1/28/2011	129.71	114.24		0.00	142.56	28.32
W-7	1/28/2011	NM	96.11		0.00	141.97	NA
W-8	1/28/2011	NM	79.00		0.00	141.11	NA
W-9	1/28/2011	110.37	94.47		0.00	139.84	45.37
W-10	1/28/2011	110.21	104.41		0.00	140.71	36.30
W-11	2/2/2011	112.61	108.66	108.08	0.58	142.10	33.90
W-12	1/28/2011	116.10	109.55		0.00	145.15	35.60
W-14 A	1/28/2011	111.85	99.27		0.00	114.71	15.44
W-14 B	1/28/2011	112.09	96.94		0.00	114.78	17.84
W-14 C	1/28/2011	166.57	97.15		0.00	114.78	17.63
W-15 A	1/28/2011	125.70	116.27		0.00	127.59	11.32
W-15 B	1/28/2011	155.60	116.11		0.00	127.61	11.50
W-15 C	1/28/2011	197.34	115.71		0.00	127.59	11.88
W-16 A	1/28/2011	123.12	114.43		0.00	147.60	33.17
W-16 B	1/28/2011	160.25	118.59		0.00	147.68	29.09
W-16 C	1/28/2011	196.30	118.73		0.00	147.67	28.94
W-17 A	1/28/2011	108.30	103.26		0.00	141.38	38.12
W-17 B	1/28/2011	169.60	106.96		0.00	141.37	34.41
W-17 C	1/28/2011	200.00	106.97		0.00	141.38	34.41
MW-101	1/28/2011	90.72	DRY		0.00	138.00	NA
MW-101	1/28/2011	94.70	DRY		0.00	139.36	NA NA
MW-104A	1/28/2011	100.08	93.70		0.00	144.13	50.43
MW-105	1/28/2011	100.08	DRY		0.00	141.16	NA
MW-105	1/28/2011	110.00	107.15		0.00	152.81	45.66
MW-107A	1/28/2011	109.49	104.32		0.00	147.02	42.70
MW-201	1/28/2011	101.60	DRY		0.00	135.65	42.70 NA
MW-202	1/28/2011	92.55	DRY		0.00	140.62	NA NA
MW-203	1/28/2011	102.30	DRY		0.00	143.71	NA NA
MW-204		102.30	DRY		0.00	142.90	NA NA
	1/28/2011		ł				
MW-205	1/28/2011	98.27 93.27	DRY		0.00	140.09 130.89	NA
MW-501A	1/28/2011		DRY		0.00		NA NA
MW-502	1/28/2011	100.59	DRY	107.00	0.00	131.00	NA 25.52
MW-503B	2/4/2011	108.67	107.63	107.00	0.63	132.66	25.53
MW-504	1/28/2011	95.76	DRY		0.00	137.18	NA
MW-600A	1/28/2011	92.70	DRY		0.00	124.26	NA
MW-601A	1/28/2011	89.90	NM		0.00	126.53	NA NA
MW-603	1/28/2011	97.60	DRY		0.00	120.95	NA NA
MW-604	1/28/2011	103.20	DRY		0.00	140.07	NA NA
MW-605	1/28/2011	93.98	DRY		0.00	116.82	NA NA
MW-606	1/28/2011	99.05	DRY		0.00	116.06	NA NA
MW-607	1/28/2011	107.05	DRY		0.00	128.28	NA
MW-701	1/27/2011	130.00	106.01		0.00	139.48	33.47
MW-702	1/27/2011	130.00	105.95		0.00	140.12	34.17
MW-703	1/27/2011	130.00	107.44		0.00	137.23	29.79
MW-704	2/9/2011	130.00	109.07		0.00	137.66	28.59
MW-705	1/25/2011	130.00	109.82		0.00	141.94	32.12
MW-706	1/24/2011	130.00	106.22		0.00	139.30	33.08

Table II Summary of Groundwater Level Measurements - Q1 2011 Former CENCO Refinery Santa Fe Springs, CA

Well ID	Date	Total Depth	Depth to	Depth To	FPPH	Top of Casing	Groundwater
			Groundwater	FPPH	Thickness	Elevation	Elevation
MW-707	1/28/2011	130.00	103.75		0.00	128.43	24.68
MW-708	2/2/2011	130.00	102.85	102.72	0.13	126.26	23.51
MW-709	2/1/2011	130.00	112.56		0.00	139.78	27.22
MW-710	2/8/2011	130.00	100.65		0.00	121.99	21.34
MW-711	2/8/2011	130.00	107.79		0.00	127.84	20.05
MW-712	2/9/2011	130.00	105.00		0.00	123.31	18.31
MW-713	2/9/2011	130.00	110.49		0.00	128.15	17.66
MW-714	2/14/2011	142.00	110.25		0.00	128.87	18.62
MW-715	2/14/2011	134.00	102.55		0.00	116.22	13.67

NOTES:

ft Feet

FPPH Free-phase petroleum hydrocarbon

amsl Above mean sea level

NM Not measured, inaccessible

NA Not available/applicable

Table III Summary of Soil FPPH Investigation Results Former CENCO Refinery Santa Fe Springs, CA

			Approximate				
	Observed	Observed	Depth to	PID Above		PID Below	
Well ID	Product	Staining	Water (ft)	Water	PID @ Water	Water	Field Observations
MW-703	No	No	105	0 @100	15 @105	74 @120	No Odor above water - 90 to 100
MW-704	No	Yes	109	376 @105	298 @110	702 @115	Hydrocarbon Odor; staining at 67, 77, 120 to 124
MW-707	No	No	110	>2000 @85	84.6 @110	345 @115	Hydrocarbon odor
MW-708	No	No	105	>2000 @100	>2000 @105	>2000 @110	Strong Hydrocarbon odor

<u>Notes</u>

ft - Feet

PID - Reading from Photoionization Detector

Table IV ROST Fluorescence Reponse Data Former CENCO Refinery Santa Fe Springs, CA

Fluorescence

Well ID	(%RE)	Sample of Free Product Material
MW-503B	162%	MW-503 B 2.4.11
MW-708 (1)	183%	MW-708 4.6.2011
MW-708 (2)	206%	
MW-708 (3)	18%	
EW-1	77%	EW-1 2.3.11
W-11	48%	W-11 12.8.2010

Table V Summary of ROST Investigation Results Former CENCO Refinery Santa Fe Springs, CA

				Max			
		Completed	Approximate GW	Fluorescence	Depth of Max	Fluerescence Intensity	
ROST		Depth	Depth	Intensity	Fluorescence	Near Groundwater	
Location ID	Date	(ft-bgs)	(ft-bgs)	(%)	(ft-bgs)	Table ²	Interpretation
FPB-01	7/22/2009	103.88	102	11.97	7.69	5	Not indicative of FPPH
FPB-02	2/21/2008	70.1	102	11.65	45.2	NA NA	Hit refusal
11 5 02	2/21/2000	70.1	102	11.03	13.2	107	
FPB-03	7/22/2009	85.03	100	2.46	5.06	20	Not indicative of FPPH, Indicative of a smear zone, hit refusal at 85 feet
FPB-03A	7/22/2009	105.04	100	30.04	95.5	20	Not indicative of FPPH, Indicative of a smear zone
FPB-04	7/23/2009	104.64	100	34.99	30.46	5	Not indicative of FPPH, near groundwater but indicative of highly saturated soil with heavy fuel
FPB-04R	7/24/2009	109.26	100	42.73	35.78	1	Not indicative of FPPH, near groundwater but indicative of highly saturated soil with heavy fuel. CPT was also performed at this location
FPB-05	2/21/2008	100.71	98	67.83	48.55	10	Not indicative of FPPH near groundwater, at 50 ft may be indicative of highly saturated soil with light fuel
FPB-06	7/23/2009	103.02	99	7.79	93.19	5	Not indicative of FPPH
FPB-07	2/21/2008	100.01	99	4.55	5.53	<1	Not indicative of FPPH
FPB-08	7/23/2009	100.05	100	1.31	7.13	<1	Not indicative of FPPH. CPT was also performed at this location.
FPB-09	3/29/2011	56.12		0.92	0.67	NA	Hit refusal at 56.12 feet bgs; Not indicative of FPPH
FPB-09B	3/29/2011	94.43		1.63	9.67	<1	Not indicative of FPPH
FPB-12	7/22/2009	91.04	110	6.72	53.43	1	Not indicative of FPPH
FPB-13	7/24/2009	102.23	102	42.21	52.97	<1	Not indicative of FPPH
FPB-10	3/29/2011	N/A					CPT hit refusal at 64.12 ft bgs as a result ROST was not performed
FPB-11	3/29/2011	66.42		1.84	1.42	NA	Hit refusal at 66.42 feet bgs; Not indicative of FPPH
FPB-11A	3/29/2011	85.36		1.55	1.16	NA	Hit refusal at 79.45 feet bgs; Not indicative of FPPH
FPB-14	3/29/2011	79.45		1.52	26.48	NA	Hit refusal at 80 feet bgs; Not indicative of FPPH

<u>Notes</u>

ft-bgs - Feet below ground surface

¹ GW Depth at time of ROST implementation

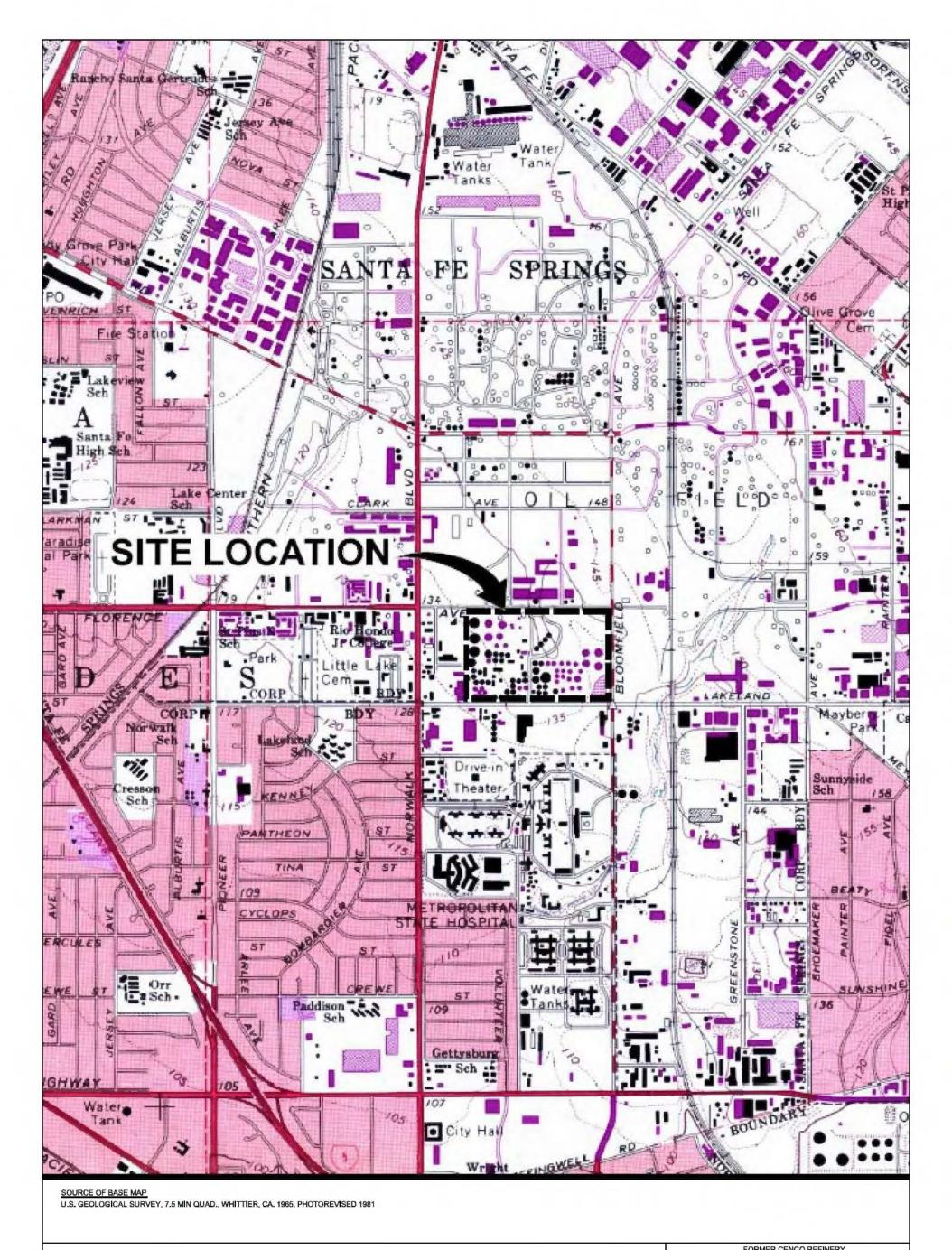
² Fluorescence intensity indicative of FPPH is on the order of 100% or more for lighter product NA - Not Applicable

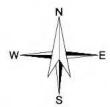
Table VI Summary of FPPH Measurements (Bail-Down Test) Former CENCO Refinery Santa Fe Springs, CA

Date	DTFPPH	DTW	FP Thickness	Comments
		EW	'-1	
1/28/2011	105.54	105.98	0.44	
2/3/2011	105.65	106.04	0.39	Before purge
2/3/2011		105.64	0	1 hr after
2/3/2011		105.65	0	2 hrs
2/3/2011		105.66	0	4 hrs
2/4/2011		105.59	0	24 hrs
2/7/2011	105.68	105.70	0.02	72+ hrs
2/14/2011	105.81	105.84	0.03	10 days+
3/22/2011	105.79	106.25	0.46	
3/29/2011	105.76	106.31	0.55	
4/11/2011	105.77	106.4	0.63	
4/13/2011	105.91	106.6	0.69	
4/13/2011	-	106.04	NA	
4/18/2011	106.04	106.19	0.15	
4/19/2011	105.96	106.12	0.16	
4/21/2011	105.96	106.25	0.29	
		W-	11	
1/28/2011	108.08	108.66	0.58	
3/22/2011	-	107.75	NA	
3/29/2011	-	107.53	NA	
4/15/2011	-	107.33	NA	
4/15/2011	-	107.3	NA	
4/19/2011	-	107.23	NA	
4/21/2011	-	107.22	NA	
		MW-5	503B	
2/3/2011	107.00	107.63	0.63	Before purge
2/3/2011	108.02	108.12	0.10	1 hr after
2/3/2011	107.87	108.00	0.13	2 hrs
2/3/2011	107.69	107.86	0.17	4 hrs
2/4/2011	106.78	107.10	0.32	24 hrs
2/7/2011	106.91	107.41	0.50	72+ hrs
2/14/2011	106.99	107.45	0.46	10 days+
3/22/2011	-	106.5	NA	·
3/29/2011	-	106.36	NA	
4/11/2011	-	106.15	NA	
4/14/2011	-	106.07	NA	
4/15/2011	-	106.09	NA	
4/19/2011	-	106.04	NA	
4/21/2011	-	106.02	NA	

Table VI Summary of FPPH Measurements (Bail-Down Test) Former CENCO Refinery Santa Fe Springs, CA

Date	DTFPPH	DTW	FP Thickness	Comments									
	MW-708												
2/3/2011	102.72	102.85	0.13	Post development									
3/22/2011	-	102.05	NA										
3/29/2011	101.91	102.29	0.38										
4/11/2011	101.71	101.92	0.21										
4/19/2011	101.65	101.85	0.20										
4/21/2011	101.63	101.92	0.29										





SCALE: NOT TO SCALE

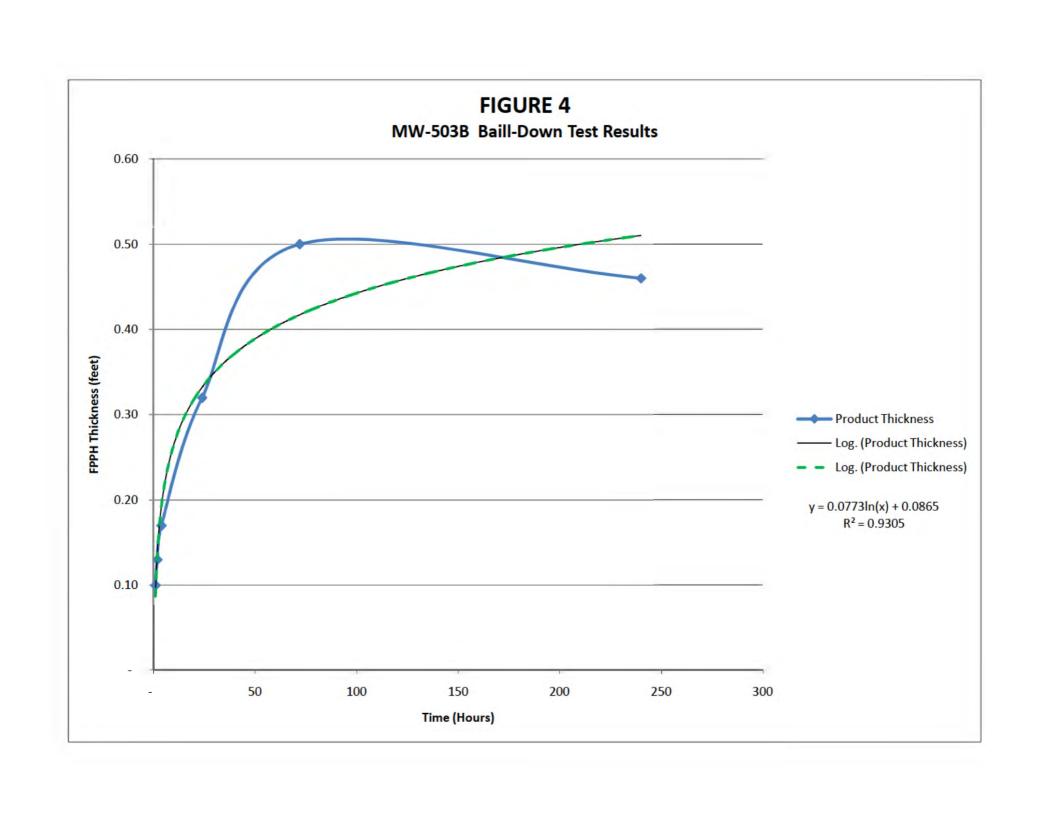
FORMER CENCO REFINERY 12345 LAKELAND ROAD SANTA FE SPRINGS, CALIFORNIA

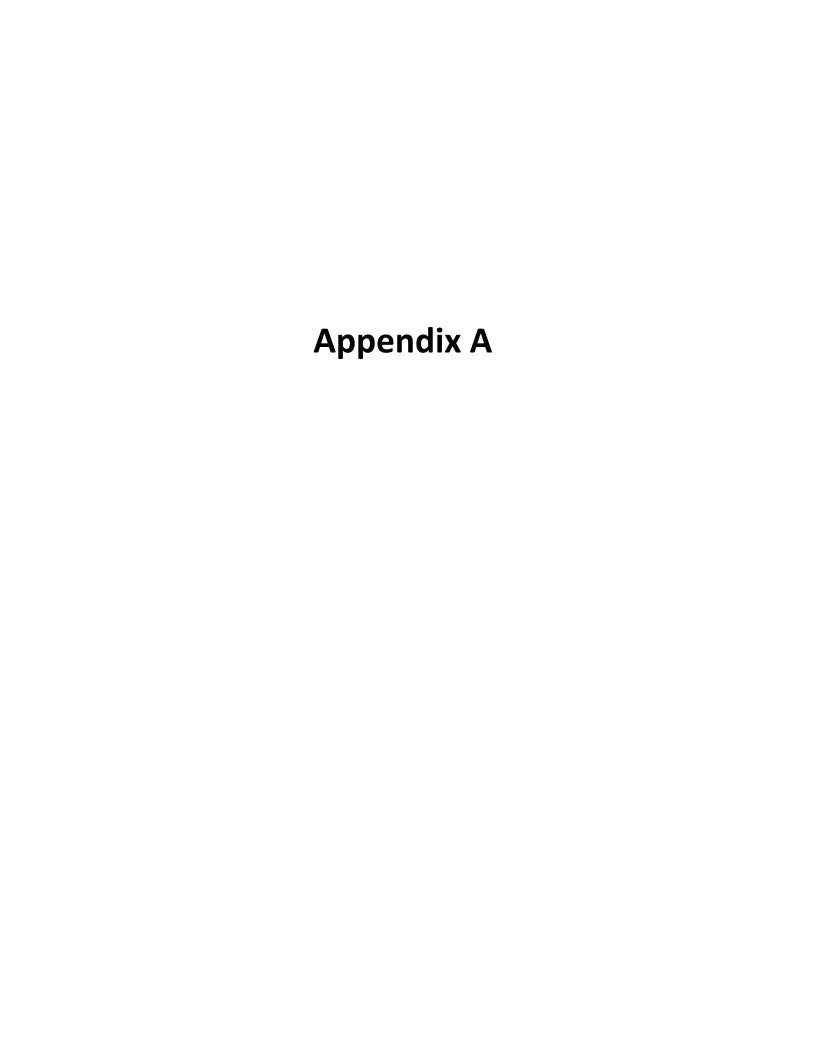
SITE LOCATION MAP



FX-9 Wells

FX-9 Wells







California Regional Water Quality Control Board

Los Angeles Region

Recipient of the 2001 Environmental Leadership Award from Keep California Beautiful

Linda S. Adams Agency Secretary 320 W. 4th Street, Suite 200, Los Angeles, California 90013

Phone (213) 576-6600 FAX (213) 576-6640 - Internet Address: http://www.waterboards.ca.gov/losangeles



January 11, 2008

Mr. Michael Barranco CENCO Refinery Company 12345 Lakeland Road Santa Fe Springs, California 90670

CONDITIONAL APPROVAL OF WORKPLANS FOR SOIL GAS SURVEY, FREE PHASE PETROLEUM HYDROCARBON INVESTIGATION, SUPPLEMENTAL SOIL INVESTIGATION, AND BASELINE RISK ASSESSMENT – CENCO REFINERY – 12345 LAKELAND ROAD, SANTA FE SPRINGS, CALIFORNIA (SITE CLEANUP PROGRAM CASE NO. 0318, SITE ID NO. 2040071, CAO 97-118)

Dear Mr. Barranco:

The Los Angeles Regional Water Quality Board (Regional Board) staff have received and reviewed the following documents submitted by ARCADIS BBL regarding the former CENCO Refinery located at 12345 Lakeland Road, Santa Fe Springs, California (Site):

- Supplemental Soil Investigation Work Plan, dated August 31, 2007,
- Free Phase Petroleum Hydrocarbon Investigation Work Plan, dated August 31, 2007.
- · Baseline Risk Assessment Work Plan, dated September 4, 2007, and
- Revised Off-Site Soil Gas Survey Work Plan, dated August 14, 2007.

These workplans were submitted to the Regional Board and the Department of Toxic Substances Control (DTSC) as required in the Regional Board letter, dated April 3, 2007 in compliance with Cleanup and Abatement Order (CAO) No. 97-118. Because a hospital and an elementary school are present within 1,000 feet of the Site, the DTSC is coordinating with Regional Board staff to review site documents and thereby ensure that risks to human health are addressed by your investigations. The workplans adequately address and satisfy Regional Board and DTSC requirements. You are directed to implement the workplan with conditions noted below.

California Environmental Protection Agency

REQUIREMENTS:

Based on the Regional Board's and DTSC's review of the workplans, you are required to perform the following:

- Provide an additional workplan to delineate the volatile organic compound (VOC) contamination in the soil gas, offsite to the south beneath Lakeland Road and beyond as necessary. Propose sample locations to assess VOC concentrations in the soil gas in the Metropolitan State Hospital facility. Include a health and safety plan, and soil gas investigation quality assurance (QA)/ quality control (QC) protocol. Submit this workplan to the Regional Board and DTSC by March 14, 2008.
- 2. Submit a workplan to perform a human health risk assessment (HHRA) for the Metropolitan State Hospital in accordance with AB422 (see attached). You will utilize the results of the aforementioned soil gas investigation, the free phase petroleum hydrocarbon investigation, and quarterly groundwater monitoring results. The HHRA must be submitted to the Regional Board and Mr. Steve Hariri DTSC's Project Manager who will in turn forward it to their toxicologist for review within 30 days of submitting the soil gas and free phase petroleum reports.
- 3. Submit the findings and results of the assessments approved in this letter by June 6, 2008 to this Regional Board.
- 4. For each submittal, you are required to submit a hard copy and a PDF version to Mr. Steven Hariri (shariri@dtsc.ca.gov) of the DTSC's Cypress Branch. Each submittal must also be uploaded to the State Water Resources Control Board's GEOTRACKER database.

If you have any questions, please contact Mr. Don Indermill at (213) 576-6811 or Mr. Dixon Oriola of my staff at (213) 576-6803.

Sincerely,

Tracy J. Egoscue
Executive Officer

Enclosures:

a) Regional Board Letter dated April 3, 2007

b) Chaptered AB 422 California Legislative Bill

cc: Mr. Steven Hariri, Department of Toxic Substances Control (DTSC), Cypress Branch

Mr. Tom Hall, Santa Fe Springs Fire Department

Mr. David Isola, Isola & Bowers Mr. Paris Hajali, ARCADIS BBL Mr. Leah Levy, ARCADIS BBL



California Regional Water Quality Control Board

Los Angeles Region

Recipient of the 2001 Environmental Leadership Award from Keep California Beautiful



Linda S. Adams Agency Secretary 320 W. 4th Street, Suite 200, Los Angeles, California 90013 Phone (213) 576-6600 FAX (213) 576-6640 - Internet Address: http://www.waterhoards.ca.gov/losangeles Arnold Schwarzenegger

February 2, 2007

Mr. Michael Barranco CENCO Refinery Company 12345 Lakeland Road Santa Fe Springs, California 90670 CERTIFIED MAIL RETURN RECEIPT REQUESTED 7005 1820 0001 2683 6238

REQUIREMENT FOR WORKPLAN PURSUANT TO CALIFORNIA WATER CODE (CWC) SECTION 13267 – CENCO REFINERY – 12345 LAKELAND ROAD, SANTA FE SPRINGS, CALIFORNIA (SLIC CASE NO. 0318, SLIC ID) NO. 2040071, CAO 97-118)

Dear Mr. Barranco:

The California Regional Water Quality Control Board (Regional Board), Los Angeles Region, is the public agency with primary responsibility for the protection of groundwater and surface water quality for all beneficial uses within the coastal watersheds of Los Angeles and Ventura Counties, which includes the CENCO Refinery (Site).

Your consultant, BBL, submitted the Additional Site Investigation Report dated August 2006 that includes a description of soil, soil gas, and groundwater investigative activities conducted across the site. Regional Board staff will provide comments on the full report in a separate letter. This letter addresses our concern with concentrations of volatile organic compounds (VOCs) in the soil vapor and soil matrix along the western margin of the site that are undelineated to the west. In addition, Rio Hondo Junior College is 700 feet to the west of the Site and requires a shallow soil gas assessment to ascertain whether a human health inhalation threat exists. Examples of the reported VOC concentrations that require vertical and lateral delineation along the western site boundary are as follows:

Table 1: Soil Vapor Sample Results:

Vapor Probe	Date	Depth	Benzene	Xylenes	Toluene
		(feet bgs1)	(µg/l) ²	(μg/I) ²	(μg/l) ²
V153	12/7/2005	5	5.0	65	67
	12/7/2005	10	2.8	9.9	14
V199	12/14/2005	5	36	138	110
	12/14/2005	10	52	206	160
V215	12/15/2005	5	6.5	128	3.6
	12/15/2005	10	2.5	42	2.0
	an Health Scree tial shallow soil		0.362	315	135

bgs below ground surface

μg/L micrograms per liter

California Environmental Protection Agency



Table 2: Soil Sample Results:

Soil Boring	Date	Depth	Napthalene	Xylenes
		(feet bgs1)	(μg/kg) ²	$(\mu g/kg)^2$
B183	1/25/2006	2	<200	<5.0
	1/25/2006	5	24	< 5.0
	1/25/2006	10	22,953	<200
B130	1/19/2006	2	7,800	69,200
	1/19/2006	5	6,300	28,000
	2/19/2000	10	<5.0	3,6

^{3.} bgs: below ground surface 2. µg/kg: milligrams per kilogram

Due to the proximity of the Rio Hondo College to these VOC concentrations, you are required to assess the extent of VOCs in the subsurface along or adjacent to Norwalk Boulevard. Pursuant to Division 7, Chapter 4, Article 4, Section 13267 of the California Water Code (CWC), the Regional Board is requiring you to submit a work plan for a subsurface investigation that meets the requirements as outlined below. Regional Board staff can meet with you, if necessary, to discuss an appropriate modifications to scope of work, if necessary.

REQUIREMENTS:

- Regional Board staff requires a shallow soil gas investigation in order to determine whether VOC contamination is present in the subsurface soil beneath the College and whether releases from CENCO Refinery pose a threat to human health and the groundwater quality. In addition, The Department of Toxic Substances Control (DTSC) will coordinate with Regional Board staff the review of proposed work to assure risks to human health are addressed by your investigation. You are therefore directed to submit 3 copies of all technical reports to both agencies, as required, until the investigation is complete.
- 2. The soil vapor investigation must be developed in accordance with the Advisory for Active Soil Gas Investigations, January 28, 2003, Interim Guidance for Active Soil Gas Investigation, February 25, 1997, DTSC and LARWQCB, and the County of Los Angeles Department of Public Works Guidelines for Report Submittals, 1993, Section VII, Site Assessment Report Guidelines. Please reference the attached documents.
- Once your work plan has been approved and the field work implemented, a technical report summarizing the findings shall be submitted to this Regional Board by a due-date to be specified in our approval letter to you. Please do not commence investigative work until this office has approved your work plan.
- 4. Effective July 1, 2005, all reports submitted to the Regional Board must comply with the electronic submittal of information (ESI) to be submitted over the internet, including, groundwater monitoring reports, soil and/or groundwater investigation/characterization reports, remedial action plans, requests for closure, and portable data format (PDF). The text of the regulations can be found at the URL:

http://www.waterboards.ca.gov/ust/cleanup/electronic reporting/does/final/electronic regs/dee/4/pdf

Mr. Michael Barranco CENCO Refinery

5. The California Business and Professions Code Sections 6735, 7835, and 7835.1 require that engineering and geologic evaluations and judgements be performed by or under the direction of registered professionals. Therefore, all future work must be performed by or under the direction of a registered geologist or registered civil engineer. A statement is required in the report that the registered professional in responsible charge actually supervised or personally conducted all the work associated with the project.

. 3 .

Pursuant to Section 13267(b) of the California Water Code, you are hereby directed to submit the workplan to this Regional Board by March 30, 2007. Failure to submit the required workplan by the due date specified may result in the imposition of civil hability penalties by this Regional Board of up to \$1,000.00 per day for each day the report is not received pursuant to Section 13268 of the California Water Code.

If you have any questions, please contact Mr. Don Indermill at (213) 576-6811 or Mr. Dixon A. Oriola of my staff at (213) 576-6803.

Sincerely,

Attachments

Jonathan S. Bishop Executive Officer

a) Advisory for Active Soil Gas Investigation, January 28, 2003

b) Guidelines for Report Submittals, June 1993

Sacharomski AFD

c) Interim Guidance for Active Soil Gas Investigation, February 25, 1997

Dr. Rebecca Chou, School Property Evaluation and Cleanup Division, DTSC, Cypress Branch



California Regional Water Quality Control Board

Los Angeles Region



Linda S. Adams
Cal/EPA Secretary

320 W. 4th Street, Suite 200, Los Angeles, California 90013
Phone (213) 576-6600 FAX (213) 576-6640 - Internet Address: http://www.waterboards.ca.gov/losangeles

Arnold Schwarzenegger Governor

July 21, 2010

Mr. Mike Barranco Lakeland Development Company 12345 Lakeland Road Santa Fe Springs, California 90670

REQUIREMENTS FOR SUBSURFACE INVESTIGATION AND CLEANUP PURSUANT TO CLEANUP AND ABATEMENT ORDER NO. 97-118, FORMER POWERINE / CENCO REFINERY, 12345 LAKELAND ROAD, SANTA FE SPRINGS, CALIFORNIA, (SCP NO. 0318A, SITE ID NO. 2040071)

Mr. Barranco:

The California Regional Water Quality Control Board, Los Angeles Region (Regional Board) is the state regulatory agency responsible for protecting water quality in Los Angeles and Ventura Counties, including the above-referenced site (Site). To accomplish this, the Regional Board issues investigative orders, cleanup and abatement orders, waste discharge requirement permits, tank cleanup orders, and other directives authorized by the Porter- Cologne Water Quality Control Act or the California Health and Safety Code.

You are subject to Cleanup and Abatement Order (CAO) No. 97-118 issued to Powerine Oil Company (Powerine) on August 25, 1997, pursuant to California Water Code section 13304. CAO 97-118 ordered Powerine, as the responsible party, to investigate, cleanup and abate soil contamination and groundwater pollution at, and groundwater pollution emanating from, the subject facility at 12345 Lakeland Road in Santa Fe Springs, California. The requirements of CAO 97-118 apply to Lakeland Development Company as the successor to Powerine. The Department of Toxic Substances Control (DTSC) is coordinating with Regional Board staff to review site documents and thereby ensure that risks to human health are addressed by your investigations.

The Regional Board has received the Second Quarter Groundwater Monitoring Report, dated June 25, 2010 and submitted by your consultant, Murex Environmental. A large number of wells sampled in the monitoring program no longer have groundwater and hydrocarbon impacts cannot be determined. We have thus determined that additional work is necessary to maintain groundwater monitoring capability in groundwater beneath, and extending down-gradient from, the Site. You shall submit a workplan for complete delineation of the hydrocarbon impacts to groundwater originating from the Site. The groundwater workplan shall include north-to-south and east-to-west cross sections depicting hydrostratigraphic units beneath the Site interpreted from borehole logs, existing and proposed groundwater monitoring wells with depth and perforation intervals, and historical and current groundwater levels. Submit this Groundwater Monitoring Workplan to the Regional Board and the DTSC by September 3, 2010.

The Regional Board received the *Revised Off-Site Soil Gas Survey Workplan*, dated August 14, 2007, approved it in a letter dated January 11, 2008, and extended the due date to August 29, 2008 in a June 20, 2008 letter. Regional Board staff understand the execution of the workplan has been prevented due to property access and financial issues, which have since been resolved. You shall submit a revised soil gas

survey workplan that incorporates delineation of elevated volatile organic compound (VOCs) concentrations in soil gas, offsite to the south, beneath Lakeland Road and beyond as necessary. Propose sample locations to assess VOC concentrations in the soil gas in the Metropolitan State Hospital facility. Include a health and safety plan, and soil gas investigation quality assurance (QA)/ quality control (QC) protocol. Submit this Revised Off-Site Soil Gas Assessment Workplan to the Regional Board and DTSC by September 3, 2010.

The Regional Board received the Free Phase Petroleum Hydrocarbon Investigation Work Plan, dated August 31, 2007, approved it in a letter dated January 11, 2008, and extended the due date to August 29, 2008 in a June 20, 2008 letter. No technical report has been submitted and your ability to determine the extent and thickness of free-phase petroleum hydrocarbons is severely restricted by the falling groundwater levels noted above. You shall submit an update to the Free Phase Petroleum Hydrocarbon Investigation Work Plan including recent data and data gaps, and a proposed schedule for the completion of the work. Submit this Revised Free Phase Petroleum Hydrocarbon Investigation Workplan to the Regional Board and DTSC by September 3, 2010.

The Regional Board has received the Supplemental Soil Investigation Report, dated June 8, 2009. With this submission, sufficient information regarding site contaminants and characteristics has been accumulated to allow the evaluation of potential remedial technologies that could be included in a Remedial Action Plan. You shall submit a workplan to perform pilot and/or bench scale testing on considered remedial technologies for soil and groundwater. The purpose of the testing is to develop and confirm design parameters for remediation. The workplan must include the technologies, method of testing, and an implementation schedule. Furthermore, the testing plan must address the Site specific conditions and must be representative of the various soil and contaminant conditions at the Site. Submit this Pilot Testing Workplan to the Regional Board and DTSC by September 17, 2010.

The workplans are required under CAO No. 97-118. Pursuant to section 13308 of the California Water Code you are required to submit the above-referenced workplans by the due dates. Failure to submit the required technical reports/workplans by the specific due dates may result in civil liability administratively imposed by the Regional Board in an amount up to one thousand dollars (\$1,000) for each day the technical reports/workplans are not received.

Please note that effective immediately, the Regional Board requires you to include a perjury statement in all work plans and reports submitted under 13267 orders and CAOs. The perjury statement shall be signed by a senior authorized representative of Lakeland Development Company (and not by a consultant). The statement shall be in the following format:

"I [NAME], do herby declare under penalty of perjury under the laws of California, that I am [JOB TITLE] for [Subject Site], that I am authorized to attest to the veracity of the information contained in the reports described herein, and that the information contained [NAME AND DATE OF REPORT] is true and correct, and that this declaration was executed at [PLACE], [STATE], on [DATE]."

The State Water Resources Control Board (State Water Board) adopted regulations requiring the electronic submittals of information over the Internet using the State Water Board GeoTracker database.

California Environmental Protection Agency

Mr. Mike Barranco, Lakeland Development. Co. - 3 - Former Powerine / CENCO Refinery

You are required not only to submit hard copy reports required in this Order but also to comply by uploading all reports and correspondence prepared to date and additional required data formats to the GeoTracker system. Information about GeoTracker submittals, including links to text of the governing regulations, can be found on the Internet at the following link:

http://www.waterboards.ca.gov/water_issues/programs/ust/electronic_submittal

As presented in State Water Resources Control Board Resolution 92-49, professionals should be qualified, licensed where applicable, and competent and proficient in the fields pertinent to the required activities. Moreover, the final report submitted to this Regional Board must be reviewed, signed and stamped by a California registered geologist, or a California registered civil engineer with at least five years hydrogeologic experience. Furthermore, the California Business and Professions Code Sections 6735, 7835, and 7835.1 require that engineering and geologic evaluations and judgments be performed by or under the direction of a registered geologist or registered civil engineer. A statement is required in the final report that the registered professional in responsible charge actually supervised or personally conducted all the work associated with the work plan and final report.

If you have any questions regarding this project, please contact Don Indermill of my staff at (213) 576-6811 or dindermill@waterboards.ca.gov.

Sincerely,

Interim Executive Officer

cc:

Steve Hariri, Department of Toxic Substances Control, Cypress, CA

Paris Hajali, Murex Environmental Inc., Tustin CA

David Isola, Isola & Ruiz, LLP, Lodi, CA

Linda S. Adams
Acting Secretary for
Environmental Protection

California Regional Water Quality Control Board Los Angeles Region

320 West Fourth Street, Suite 200, Los Angeles, California 90013
(213) 576-6600 • Fax (213) 576-6640
http://www.waterboards.ca.gov/losangeles



February 15, 2011

Mr. Mike Barranco Lakeland Development Company 12345 Lakeland Road Santa Fe Springs, California 90670

SUBJECT: APPROVAL OF WORK PLAN FOR FREE PHASE PETROLEUM

HYDROCARBON INVESTIGATION ADDENDUM, PURSUANT TO CALIFORNIA WATER CODE SECTION 13304 CLEANUP AND ABATEMENT

ORDER NO. 97-118

SITE: FORMER POWERINE / CENCO REFINERY, 12345 LAKELAND ROAD,

SANTA FE SPRINGS, CALIFORNIA, (SCP NO. 0318A, SITE ID NO. 2040071)

Dear Mr. Barranco:

Regional Board staff have received and reviewed the *Free Phase Petroleum Hydrocarbon* (FPPH) *Investigation Status Report*, dated September 3, 2010, prepared and submitted on your behalf by Murex Environmental. The Status Report includes an Addendum to an FPPH Work Plan previously approved by the Regional Board on January 11, 2008. The original Work Plan was submitted in response to the Regional Board's April 3, 2007 directive letter pursuant to California Water Code (CWC) section 13304 Cleanup and Abatement Order No. 91-118.

An oil refinery was operated at the Site from the 1930's until 1995 and the surrounding properties are currently used for commercial and industrial purposes. The refinery operations resulted in impact to the subsurface; primarily with petroleum hydrocarbons.

The Work Plan Addendum proposes to reposition FPB-09, perform a bail down test of FPPH recharge, and perform continuous coring during well replacement installations to be proposed in the near future. The FPPH Work Plan Addendum is approved as proposed. The Regional Board understands that the soil coring will also be described in the well replacement work plan that will be submitted shortly.

Pursuant to section 13304 of the CWC and Order No. 97-118, you are required to submit a technical report, including the FPPH Investigation results, to the Regional Board by **June 30, 2011**, for our review and approval. The new due date to submit the above technical report is an amendment to the existing CWC section 13304 Cleanup and Abatement Order No. 91-118.

The Regional Board requires you to include a perjury statement in all work plans and reports submitted under Cleanup and Abatement Orders. The perjury statement shall be signed by a senior authorized representative at your company (and not by a consultant). The statement shall be in the following format:

"I [NAME], do hereby declare, under penalty of perjury under the laws of the State of California, that I am [JOB TITLE] for [NAME OF RESPONSIBLE PARTY\DISCHARGER], that I am authorized to attest to the veracity of the information contained in the report(s) described herein, and that the information contained in [NAME AND DATE OF REPORT] is true and correct, and that this declaration was executed at [PLACE], [STATE], on [DATE]."

Pursuant to section 13350 of the CWC, failure to submit the required technical report by **June 30, 2011**, or failure to comply with provisions of Cleanup and Abatement Order No. 97-118, may result in civil liability penalties administratively imposed by the Regional Board in an amount up to five thousand dollars (\$5,000) for each day the technical report is not received and without further warning.

Should you have any questions related to this project, please telephone Don Indermill, of my staff, at (213) 576-6811, or email him at dindermill@waterboards.ca.gov.

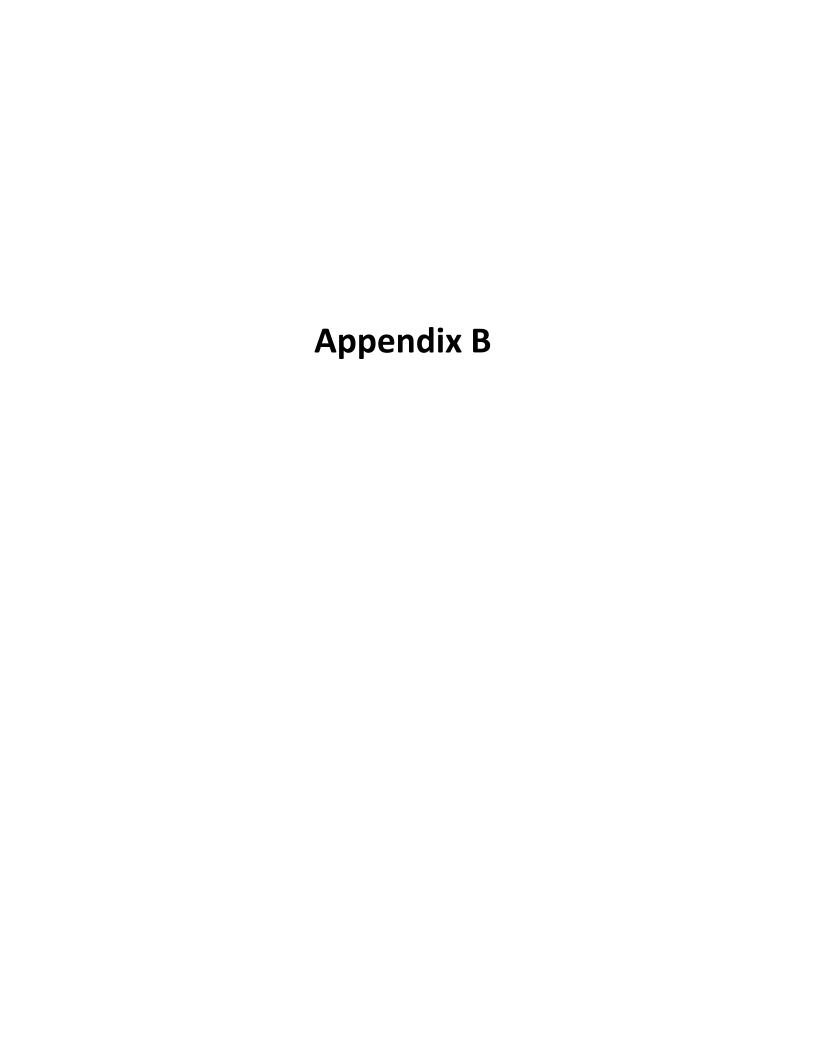
Sincerely,

Samuel Unger, P.E.

Executive Officer

cc: Jeremy Squire, Murex Environmental

Jeff Hawkins, Isola Law Group



Client: MUREX ENVIRONMENTAL

Date/Time: 4/28/2003 @ 12:41:25 AM

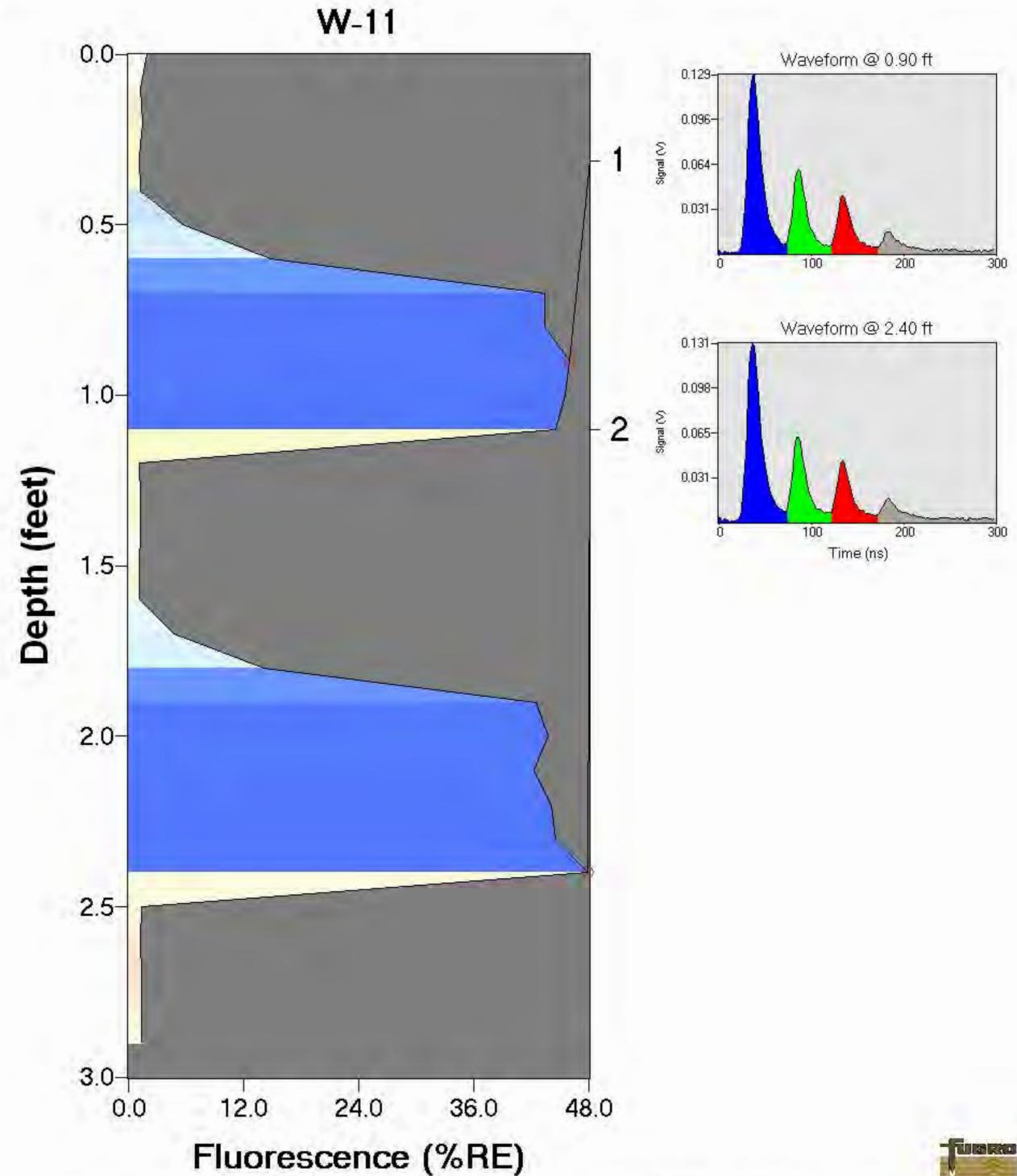
ROST Unit: III

Operator: Daniel Garza

Fugro Job #: 0409110010

Max fluorescence: 47.90% @ 2.40 ft

Final depth BGS: 2.90 ft



Client: MUREX ENVIRONMENTAL

Date/Time: 4/28/2003 @ 12:51:45 AM

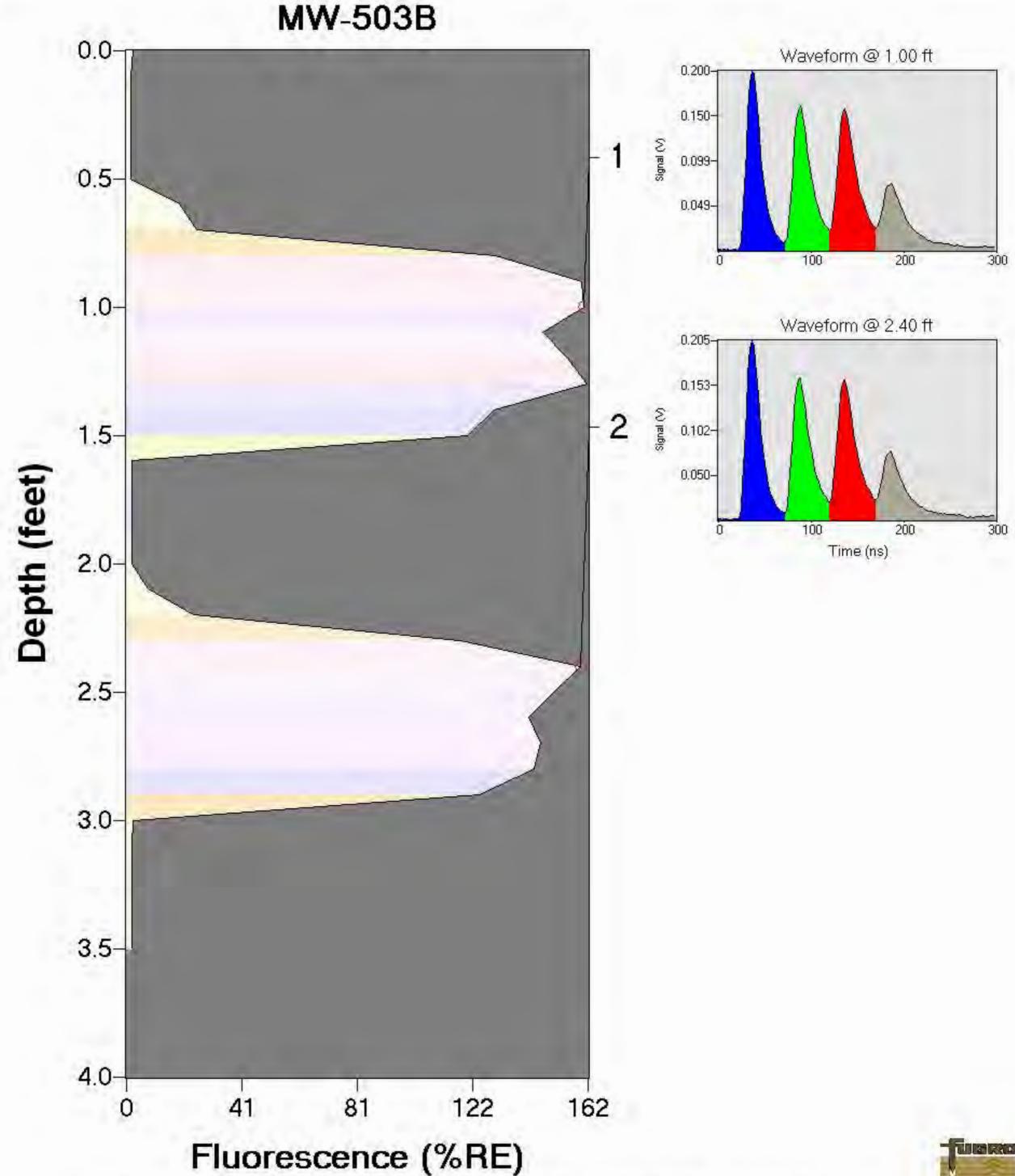
ROST Unit: III

Operator: Daniel Garza

Fugro Job #: 0409110010

Max fluorescence: 161.95% @ 1.30 ft

Final depth BGS: 3.50 ft



Client: MUREX ENVIRONMENTAL

Date/Time: 4/28/2003 @ 12:28:11 AM

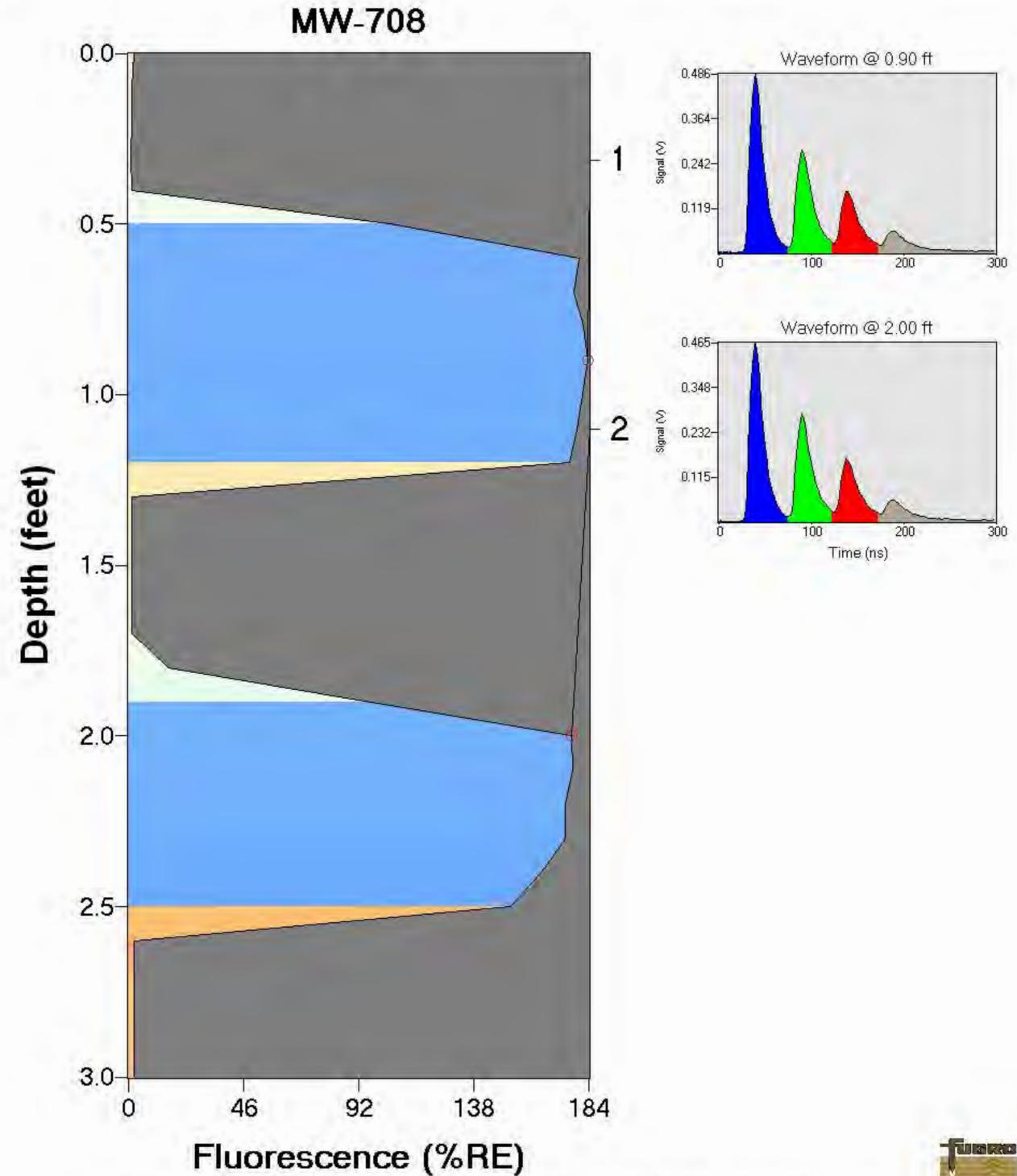
ROST Unit: III

Operator: Daniel Garza

Fugro Job #: 0409110010

Max fluorescence: 183.12% @ 0.90 ft

Final depth BGS: 8.00 ft



Client: MUREX ENVIRONMENTAL

Date/Time: 4/28/2003 @ 12:33:56 AM

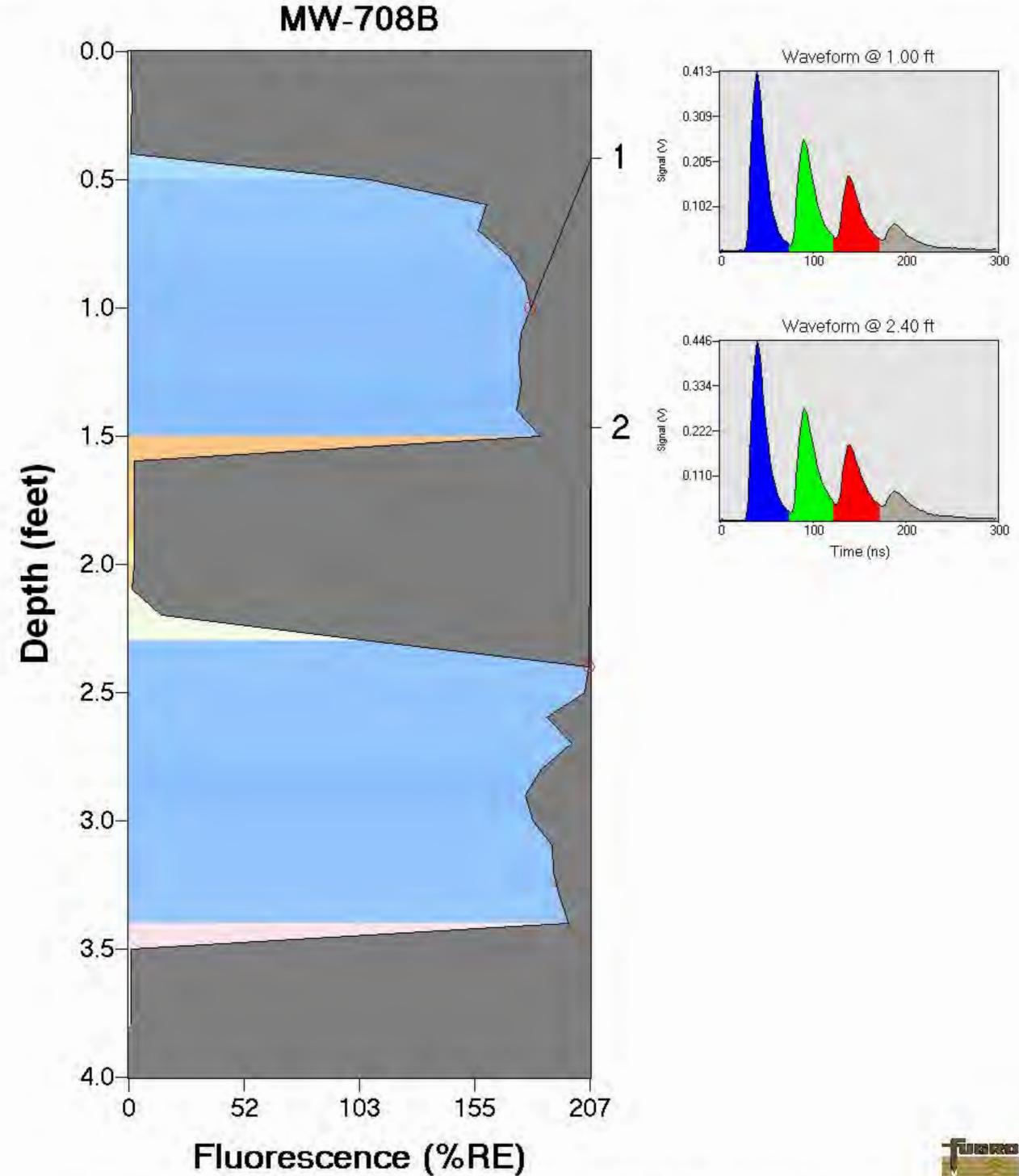
ROST Unit: III

Operator: Daniel Garza

Fugro Job #: 0409110010

Max fluorescence: 206.13% @ 2.40 ft

Final depth BGS: 3.80 ft



Client: MUREX ENVIRONMENTAL

Date/Time: 4/28/2003 @ 12:38:04 AM

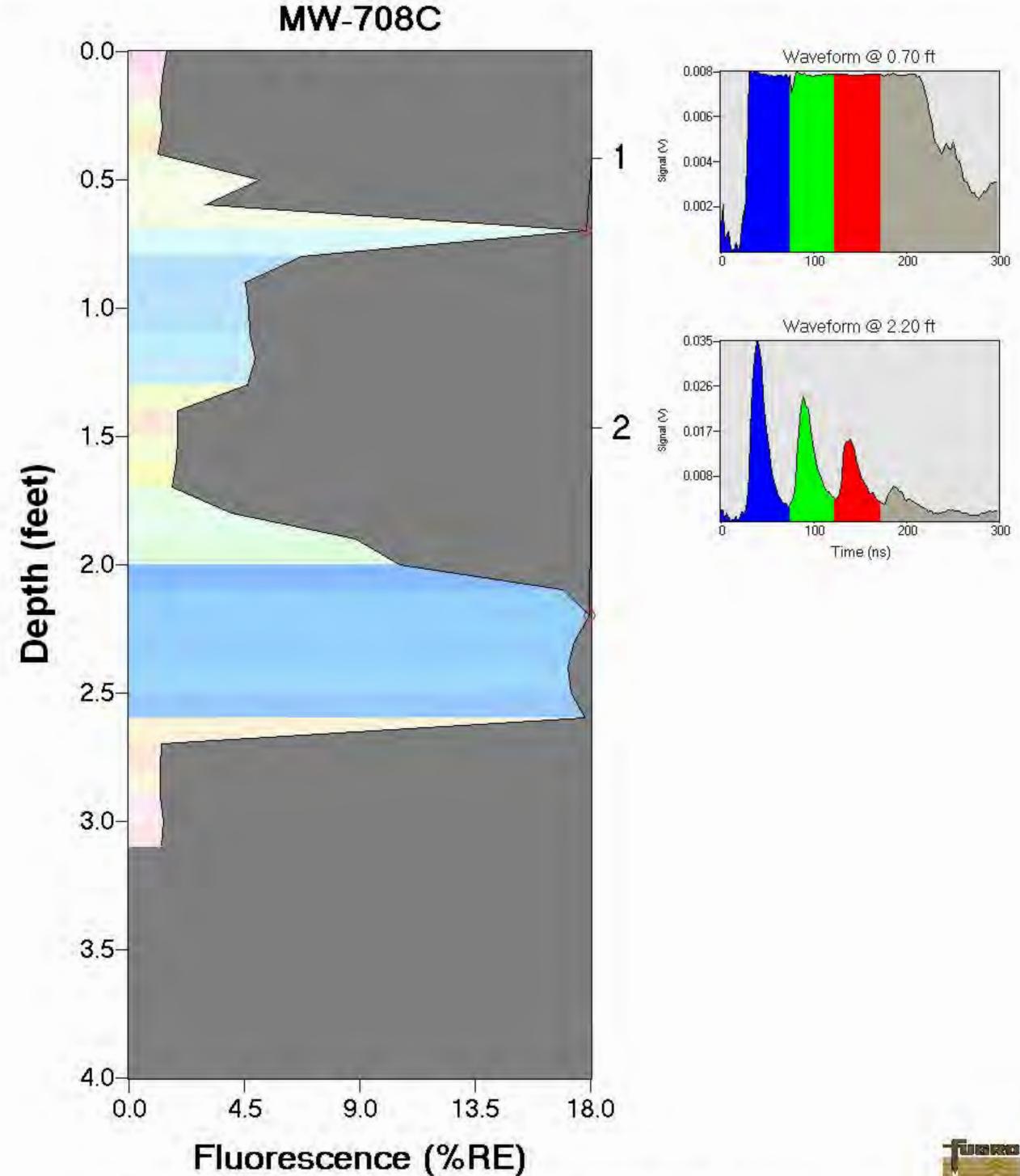
ROST Unit: III

Operator: Daniel Garza

Fugro Job #: 0409110010

Max fluorescence: 17.99% @ 2.20 ft

Final depth BGS: 3.10 ft



Client: MUREX ENVIRONMENTAL

Date/Time: 4/28/2003 @ 12:46:43 AM

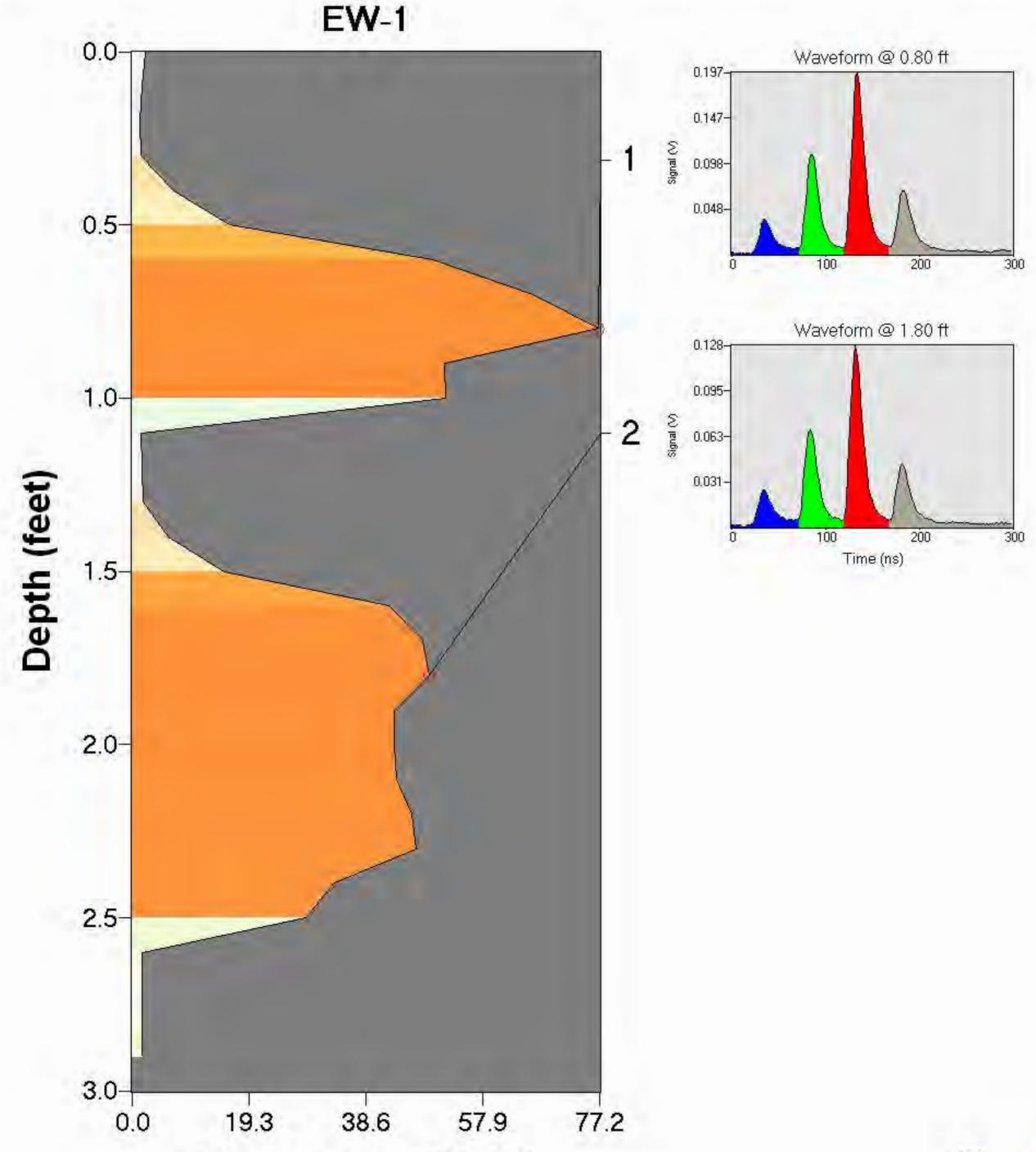
ROST Unit: III

Operator: Daniel Garza

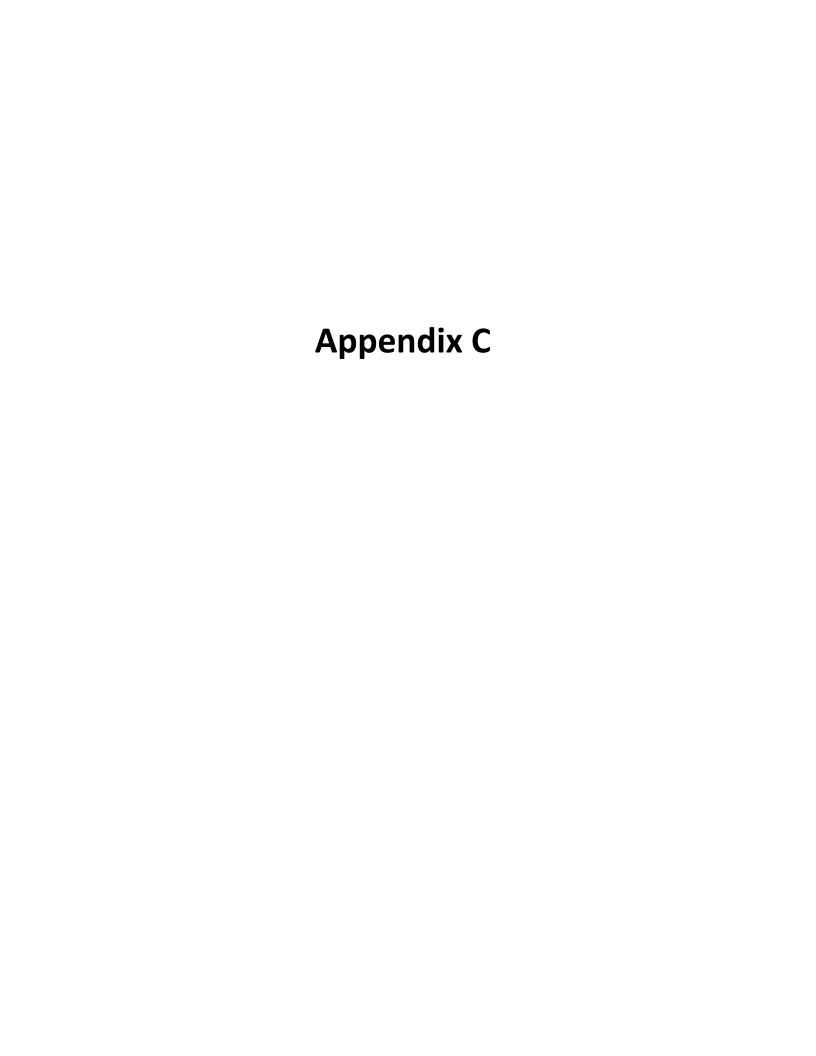
Fugro Job #: 0409110010

Max fluorescence: 77.04% @ 0.80 ft

Final depth BGS: 2.90 ft



Fluorescence (%RE)



envi	MUR	REX tal, inc					В	ORING LO	og								١	JW.		01	
PROJECT		Well Installati	00								MELE	ILE NO.		100	03-00	Pag	1000	1		of	5
LOCATION		12345 Lakelar		Fe Springs	CA							CT MGR.			emy				—	_	
CLIENT		Lakeland Deve			, cri						FIELD			_		_	-	rane	Sosie		
CONTRACT	TOR	WDC, Montcle										STARTED			/3/20					-	_
DRILLER		Lead driller: E	CONTRACTOR OF THE PARTY OF THE	rs: Ricardo	, Bobby							FINISHED		_	/6/20	-					
Elevation	136.87		Datum			Boring Lo	reation	West side of F	ofinanis	one MW 101	The state of the s	A MANAGEMENT OF THE PARTY OF TH							=	—	=
Item	130.67	Casing	Samp	der Cor	re Barrel		& Model		CME		Har	nmer Type	Dr	illing	Mud		г	To	tal D	enth	7
Туре		CFA	S		NA	✓ Truc			7	Cat-Head		Safety	 	_	ntonit	_	┢	_			_
Inside Diame	ter (in.)	5-3/4"	2"		NA.	☐ ATV				Winch		Doughnut	ΙĦ		ymer	100	ı		13	3'	
Hammer We	ight (lb.)	NA	140)		☐ Trac		The Control of the Co		Roller Bit	4	Automatic	4	Nor	ne					7	
Hammer Fall	(in.)	NA	30			Skid		Hand Auger	J	Cutting Head	Drilling	Notes: Sar	mples for	visua	al-ma	anua	I ID o	nly			
Depth (ft.)	Recovery %	Blow Counts	Sample Depth (ft.)	Well Diag	gram	PID	USCS Symbol	(density/consiste size*, struct	ncy, colo	ual Identification & r, GROUP NAME & s , moisture, optional interpretation)	SYMBOL, m	naximum par		Havel File	Se	Sand Wedium		% Fines		Toughness Tough	Plasticity e
— 0 —			5'			00	ML	3" Road base Hand auger firs Dark brown silt		and, moist, no oc	dor					5	20	75			
_ 10 _		F	10'-11.5'			00	SM	Light brown sil	ty sand,	moist, no odor			1				55	45			
– 15 –		1	15'-16.5'			00	SM	Light gray silty	sand, m	oist, slight VOC	odor						75	25			
_ 20 _		-	20'-21.5'			00	SM	Olive gray silty	sand, m	noist, no odor						5	75	20			

Well Diagram Water Level Data Sample ID Summary Depth in feet to: Riser Pipe **Elapsed Time** CC Cont. Core Screen Boring Depth (Linear ft.) 133' Time Stabilized Date 0,3 (hr.) First Water Thin Wall Tube Filter Sand Sample Method Cal Mod Split Spoon Water Undisturbed Sample Cuttings Number of Samples Split Spoon Sample Grout 3888 BORING NO. Cuncrete G Geoprobe MW-701 111 Bentonite Seal **Field Tests** Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High

> Dry Strength: NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

N - None L - Low M - Meduim H - High V - Very High

Toughness:

L - Low M - Medium H - High

NOTE: Soil identifications based on ASTM Method D2248 "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)"



BORING NO.
MW-701

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Recovery (%)	Blow Counts	Sample Depth (ft.) 20'-21 5	Well Dia	ngram	PID 0.0	USCS Symbol	Visual-Manual Identification & Description (density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation) Olive gray silty sand, moist, no odor	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity
		20'-21 5			0.0	SM	Olive gray silty sand, moist, no odor									
		25'-26.5'			0.0	SM/ML	Light brown silty sand/sandy silt, moist, no odor					50	50			
		30'-31.5'			0.0	SM	Brown silty sand, moist, no odor			5	10	50	35			
		35'-36.5'			0.0	SP-SM	Dark brown poorly graded sand with silt, moist, no odor			25	25	40	10			
		40'-41.5'			0.0	SM	Dark brown silty sand, moist, no odor			25	25	25	25			
		45'-46.5'			0.0	SP	Brown poorly graded sand with silt, moist, no odor				10	80	10			
		50'-51.5'			0.0	SP-SM	Dark brown poorly graded graded sand with silt, moist, no odor			40	40	10	10			
			35'-36.5' 40'-41.5'	35'-36.5' 40'-41.5'	35'-36.5' 40'-41.5'	35'-36.5' 0.0 40'-41.5' 0.0	35'-36.5' 0.0 SP-SM 40'-41.5' 0.0 SM	35'-36.5' 0.0 SP-SM Dark brown poorly graded sand with silt, moist, no odor 40'-41.5' 0.0 SM Dark brown silty sand, moist, no odor 45'-46.5' 0.0 SP Brown poorly graded sand with silt, moist, no odor	35'-36.5' 0.0 SP-SM Dark brown poorly graded sand with silt, moist, no odor 40'-41.5' 0.0 SM Dark brown silty sand, moist, no odor 45'-46.5' 0.0 SP Brown poorly graded sand with silt, moist, no odor	35'-36.5' 0.0 SP-SM Dark brown poorly graded sand with silt, moist, no odor 40'-41.5' 0.0 SM Dark brown silty sand, moist, no odor 45'-46.5' 0.0 SP Brown poorly graded sand with silt, moist, no odor	35'-36.5' 0.0 SP-SM Dark brown poorly graded sand with silt, moist, no odor 25 40'-41.5' 0.0 SM Dark brown silty sand, moist, no odor 25 45'-46.5' 0.0 SP Brown poorly graded sand with silt, moist, no odor	35'-36.5' 0.0 SP-SM Dark brown poorly graded sand with silt, moist, no odor 25 25 40'-41.5' 0.0 SM Dark brown silty sand, moist, no odor 25 25 45'-46.5' 0.0 SP Brown poorly graded sand with silt, moist, no odor 10	35'-36.5' 0.0 SP-SM Dark brown poorly graded sand with silt, moist, no odor 25 25 40 40'-41.5' 0.0 SM Dark brown silty sand, moist, no odor 25 25 25 45'-46.5' 0.0 SP Brown poorly graded sand with silt, moist, no odor 10 80	35'-36.5' 0.0 SP-SM Dark brown poorly graded sand with silt, moist, no odor 25 25 40 10 40'-41.5' 0.0 SM Dark brown silty sand, moist, no odor 25 25 25 25 25 25 25 25 25 25 25 25 25 2	35'-36.5' 0.0 SP-SM Dark brown poorly graded sand with silt, moist, no odor 25 25 40 10 40'-41.5' 0.0 SM Dark brown silty sand, moist, no odor 25 25 25 25 25 25 25 25 25 25 25 25 25	35'-36.5' 0.0 SP-SM Dark brown poorly graded sand with silt, moist, no odor 25 25 40 10 40'-41.5' 0.0 SM Dark brown silty sand, moist, no odor 25 25 25 25 45'-46.5' 0.0 SP Brown poorly graded sand with silt, moist, no odor 10 80 10

NOTE: Soil identifications based on ASTM Method D2248 "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)"



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								Visual-Manual Identification & Description	Gra	avel		Sano	ł			Field ⁻	Test	1
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well	Diagran	n PID (PPM)	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
— 50 —			50'-51.5'			0.0	SP-SM	Dark brown poorly graded sand with silt, moist, no odor										
– 55 –			55'-56 5'			0.0	SW-SM	Light brown well graded sand with silt, moist, no odor			30	30	30	10				
- 60 -	_		60'-61.5'			0.0	SW-SM	SAA			30	30	30	10				
– 65 –	-		65'-66.5'			0.0	SP-SM	Light brown poorly graded sand with silt		5	5	20	60	10				
– 70 –	-		70'-71 5'			0.0	SW-SM	Light brown well graded sand with silt and gravel	10	10	20	20	30	10				
- 75 -			75'-76.5'			2.9	SP-SM	Olive gray poorly graded sand with silt, moist, VOC odor					90	10				
- 80 -			80'-81.5'			0.0	SP-SM		С	F	С	М		10 FS		T	P	S
Fie	ld Tests	Dilatancy: Toughness:				N - None n H - High		Plasticity: N - Nonplastic L - Low M - Medium H - High Dry Strength: N - None L - Low M - Medium H - High V - Very H	igh	_			_					_]
				NC	DTE: Max	imum Particle		ermined by direct observation within the limitations of sampler size.										コ
		NOT	E: Soil identifi	cation	ns based	on ASTM Met	hod D2248	"Standard Practice for Description and Identification of Soils (Visual-Manual Pro	cedu	re)"								┙



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							Visual-Manual Identification & Description	Gra	avel		Sand	ł			Field 1	Гest	1
Depth (ft.)	Recovery	Blow Counts	Sample	Well Diagram	PID	USCS	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle				E			_	SS		
Deptii (it.)	(%)	blow counts	Depth (ft.)	Well Diagrain	FID	Symbol	size*, structure, odor, moisture, optional descriptions, geologic	% Coarse	% Fine	% Coarse	% Medium	ine	% Fines	Dilatancy	Toughness	Plasticity	Strength
							interpretation)	٥ %	% Fi	%	%	% Fine	% Fi	Dila	Tou	Plas	Stre
— 80 —			80'-81.5'		0.0												
							Light gray poorly graded sand with silt, moist, strong VOC										
— 85 —			85'-86.5'		50.7	SP-SM	odor					90	10				
										Ĭ			ĺ				
										Ĭ			ĺ				
— 90 —			90'-91.5'		9.8	SP-SM	Olive gray poory graded sand with silt, moist, VOC odor			5	5	80	10				
										Ĭ			1				
										Ĭ			1				
05			95'-96.5'		2.5	CD CAA	Deale conserve and the conserve and the city and city			5	_	80	10				
95			95 -96.5		2.5	SP-SM	Dark gray poorly graded sand with silt, moist, VOC odor			5	5	80	10				
— 100 —			100'-101.5'		0.0	SM	Greenish gray silty sand, moist, no odor				10	75	15				
										Ĭ			ĺ				
										Ĭ			1				
_ 105 _			105'-106.5'		0.0	SM	SAA				10	75	15				
							First water at 106.08										
							1 1130 Water at 100.00										
										Ĭ			1				
_ 110 _			110'-111.5'		11.1	SM	Olive gray silty sand, moist, strong VOC odor			_	10	70	1 =				
_ 110 _			110-111.3		11.1	JIVI	Tolive gray silly sailu, moist, strong voc ouoi			٦	10	70	12				
										ĺ			1				
								۲	F	۲	M	F	F۲	D	Т	P	S
Fiel	d Tests	Dilatancy:	R - Rap	id S-Slow I	N - None	L	Plasticity: N - Nonplastic L - Low M - Medium H - High	Č	لٺ	۲	141			٦	<u> </u>		Ť
		Toughness:	L - Low	M - Medium		Cl! !:	Dry Strength: N - None L - Low M - Meduim H - High V - Very Hi	gh									4
		NOTE	E: Soil identifi				ermined by direct observation within the limitations of sampler size. "Standard Practice for Description and Identification of Soils (Visual-Manual Pro	edu	re)"						—	—	\dashv
		14011							-1								_



BORING NO.

MW-701

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							Visual-Manual Identification & Description	Gr	avel		Sand			F	ield 1	Test	
Depth (ft.)	Recovery	Blow Counts	Sample	Well Diagram	PID	USCS	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle	e,		ė	Ę			5	ess	≥	ے
	(%)		Depth (ft.)			Symbol	size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
							· · ·	%	%	%	%	%	%	Ö	욘	ΕĞ	St
_ 110 _			110'-111.5'		0.0	SM	Olive gray silty sand, moist, strong VOC odor										
_ 115 _			115'-116.5'		0.0	SM	SAA			5	10	70	15				
							Possible heaving sands				10	, 0					
							1 ossible fieuving surius										
— 120 —			120'-121.5'		0.0	SP-SM	Dark gray poorly graded sand with silt, wet, no odor		5	5	10	70	10				
— 125 —			125'-126.5'		0.0	SM	Dark gray silty sand, wet, no odor			5	25	50	20				
							6 1, 1 1, 1 1, 1 1, 1										
420			4201 424 51		0.0	Ch4	SAA				20	-0	20				
— 130 —			130'-131.5'		0.0	SM	SAA				20	50	30				
								1		1							
— 135 —								1		1							
		1															ļ
																	ļ
								1		1							
_ 140 _		1															
		1															
								С	F	С	M	F	FS	D	T	P	S
Field	d Tests	Dilatancy:		id S - Slow I			Plasticity: N - Nonplastic L - Low M - Medium H - High		-						_		٦
		Toughness:	L - Low	M - Medium		Sizo in d-	Dry Strength: N - None L - Low M - Meduim H - High V - Very Hi	gh							_		4
—		NOT	E: Soil identifi				termined by direct observation within the limitations of sampler size. "Standard Practice for Description and Identification of Soils (Visual-Manual Proc	ced	ıre)"						—		\dashv
		NOT	L. Jon Activiti	eactoris paseu	on Aprily lyiet	52240	Table 1	Jeut							—		_

envii	MUF	REX ital, inc				В	ORING LOG									NO.		
PROJECT LOCATION		Well Installation		Eo Carinar CA				MEI FILE NO. PROJECT MGR.		_	3-00	Page 1-200 Squir	0	1	17.6	of	5	5
Carlo San								FIELD REP.		-	-		e		—	—	—	_
CLIENT CONTRACT	OB	Lakeland Deve		р.				DATE STARTED			ne So				_	_	_	_
DRILLER	OK	WDC, Montcla	The state of the s	s: Ricardo, Bobb				DATE FINISHED			14/20 15/20	11-74	_		—	—	—	_
Destruction of the Country	provide the			s. Ricardo, Dobb	_			TO STAND AND A STANDARD AND A STANDA		12/	13/20	310			_	=	=	=
Elevation	140.9	11000	Datum		Boring L		South side of construction office/30					_		_	_	_		_
ltem		Casing	Samp	_		e & Model		Hammer Type	Dr	illing N		_		To	tal D	epth	î.	_
Туре	Water Co.	CFA	S	NA	✓ Truc	k		Safety			tonite			4	12	41		
Inside Diame Hammer Wei		5-3/4" NA	2" 140	1000	☐ ATV			□ Doughnut ✓ Automatic	日日	Poly					13	1		
Hammer Fall	F1.11.00 W.1-01	NA NA	30		Trac			/ Partition	nples for	1177	-		ID or	di.		_	_	_
nammer Fall	(in.)	NA	30	_	SKIO					ravel		Sand	ID OI	ΙΙΥ		Field T	Tost	_
Depth (ft.)	Recovery %	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	Visual-Manual Identifica (density/consistency, color, GROUP NA size*, structure, odor, moisture, o interpreta	ME & SYMBOL, maximum par otional descriptions, geologic		П		mn m	% Fine	% Fines	T	92	Plasticity	Г
- 0 -	100%	14/21/30	5'		00	ML	3" Road base Hand auger first 5 feet Dark brown silt with sand, moist,	no odor				3 4	25	75				
_ 10 _	100%	10/14/14	10'-11.5'		00	ML	Light brown silt with sand, moist,	no odor				;	30	70				
– 15 –	80%	<mark>4/6/</mark> 14	15'-16.5'		00	SP-SM	Greenish brown poorly graded sa	nd with silt, moist, no oc	lor			10	80	10				
20	90%	11/25/31	20'-21.5'		00	ML	Olive gray sandy silt, moist, no oc	lor				5	35	60				

		Water Level Da	ata			Sample ID		Well Diagram		C M F FS D T P
			Depth ir	feet to:	.71.71		Ш	Riser Pipe	AND THE RESERVE OF THE PARTY OF	No. 2011
Date	Time	Elapsed Time (hr.)	First Water	Stabilized Water	T U S	Cont. Core Thin Wall Tube Undisturbed Sample Split Spoon Sample	100 N	Screen Filter Sand Cuttings Grout	Boring Depth (Linear ft.) Sample Method Number of Samples	131' Cal Mod Split Spoon
					G	Geoprobe	222	Cuncrete Bentonite Seal	BORING NO.	MW-702

L-Low M-Medium H-High Dry Strength: NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

N - None L - Low M - Meduim H - High V - Very High

NOTE: Soil identifications based on ASTM Method D2248 "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)"



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							Visual-Manual Identification & Description	Gra	avel	•	Sand			Fi	ield T	est
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity
- 20 -	90%	11/25/31	20'-21 5		0.0	ML										
																+
– 25 –	70%	21/35/40	25'-26.5'		3.2	SP-SM	Light gray poorly graded sand with silt,dry, no odor				20	70	10			
- 30 -	100%	9/13/20	30'-31.5'		0.0	ML	Light brown sandy silt with gray mottling, moist, no odor				5	25	70			
- 35 -	100%	15/18/23	35'-36.5'		0.0	ML	Yellowish brown sandy silt with gray and amber mottling, moist, no odor					30	70			
- 40 -	90%	18/21/32	40'-41.5'		0.0	ML	Light greenish gray sandy silt, moist, no odor					20	80			
- 45 -	80%	13/26/33	45'-46.5'		0.0	SM	Olive gray silty sand, moist, no odor				5	50	45			
– 50 –	75%	19/37/50	50'-51.5'		0.0	SP	Light gray poorly graded sand, moist, no odor				25	70	5			
								С	F	С	М	F	FS	D	Т	P 9
Field		Dilatancy:	D Dom	id S - Slow	N None		Plasticity: N - Nonplastic L - Low M - Medium H - High									



BORING NO.
MW-702

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Depth (N) No. Depth (N) No. Depth (N) Dept								Visual-Manual Identification & Description	Gra	ivel		Sand	ł		F	ield 1	est
### ### ### ### ### ### ### ### ### ##	Depth (ft.)		Blow Counts		Well Diagran	n PID		(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity
### Poor #### Poor ### Poor ### Poor ### Poor #### Poor #### Poor #### Poor #### Poor ##### Poor ##### Poor ##########	- 50 -	75%	19/37/50	50'-51.5'		0.0	SP										
Light gray poorly sorted sand with silt with dark gray non-voc staining, rounded to subrounded fine gravels, moist, non-voc odor SP	- 55 -	60%	19/27/35	55'-56.5'		0.0	SP	Light gray poorly graded sand, moist, no odor			5	75	15	5			
## Pield Texts Dilatancy: R - Rapid S - Slow N - None Dry Strength: N - Nonplastic L - Low M - Medium H - High V - Very High: N - None Low M - Medium H - High V - Very High: N - Nonplastic L - Low M - Medium H - High V - Very High: N - None Low M - Medium H - High V - Very High: N - None Low M - Medium H - High V - Very High: N - None Low M - Medium H - High V - Very High: N - None L - Low M - Medium H - High V - Very High: N - None L - Low M - Medium H - High V - Very High: N - None L - Low M - Medium H - High V - Very High: N - None L - Low M - Medium H - High V - Very High: N - None L - Low M - Medium H - High V - Very High: N - None L - Low M - Medium H - High V - Very High: N - None L - Low M - Medium H - High V - Very High: N - None L - Low M - Medium H - High V - Very High: N - None L - Low M - Medium H - High V - Very High: N - None L - Low M - Medium H - High V - Very High: N - None L - Low M - Medium H - High V - Very High: N - None L - Low M - Medium H - High V - Very High: N - None L - Low M - Medium H - High V - Very High: N - None L - Low M - Medium H - High V - Very High: N - None L - Low M - Medium H - High V - Very High: N - None L - Low M - Medium H - High V - Very High: N - None L - Low M - Medium H - High V - Very High: N - None L - Low M - Medium H - High V - Very High: N - None L - Low M - Medium M - High V - Very High: N - None L - Low M - Medium M - High V - Very High: N - None L - Low M - Medium M - High V - Very High: N - None L - Low M - Medium M - Very High: N - None L - Low M - Medium M - High V - Very High: N - None L - Low M - Medium M - High V - Very High: N - None L - Low M - Medium M - High V - Very High: N - None L - Low M - Medium M - Might M - Migh	- 60 -	90%	21/29/33	60'-61.5'		0.0	ML	Dark gray sandy silt, moist, 'tar-like' odor				5	25	70			
- 75 - 35% 12/15/28 75'-76.5' 0.0 SP Gray poorly graded sand with silt with subrounded to subangular gravels, moist, slight non-VOC odor 5 15 60 15 15 60 15 15 15 60 15 15 15 60 15 15 15 15 15 15 15 15 15 15 15 15 15	– 65 –	45%	20/30/37	65'-66 5'		0.0	SP-SM	VOC staining, rounded to subrounded fine gravels, moist,		5	5	20	60	10			
Subangular gravels, moist, slight non-VOC odor SP Subangular gravels, moist, slight non-VOC odor SP Olive gray poorly graded sand with silt, moist, slight odor SP Olive gray poorly graded	– 70 –	40%	12/30/39	70'-71 5'		0.0	SP			5	5	75	15				
Field Tests Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High Toughness: L - Low M - Medium H - High Dry Strength: N - None L - Low M - Medium H - High V - Very High NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.	- 75 -	35%	12/15/28	75'-76.5'		0.0	SP			5	15	60	15	5			
Field Tests Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High Toughness: L - Low M - Medium H - High Dry Strength: N - None L - Low M - Medium H - High V - Very High NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.	– 80 –	25%	50-4"	80'-81.5'		0.0	SP	Olive gray poorly graded sand with silt, moist, slight odor	С	F					D	Т	Р
NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.	Field	Tests					•				-						
					NOTE: Max	kimum Particle		ermined by direct observation within the limitations of sampler size.							_	_	_



BORING NO.
MW-702

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									Visual-Manual Identification & Description	Gra	avel		Sano	ı	-		Field	Test	
De	epth	n (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle	se		se	in		10	C)	ssau	≥	£
			(%)		Depth (It.)			Symbol	size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
									interpretation	%	%	%	%	%	%	Ö	2	Pi	Σ
Н	80	0 —	25%	50-4"	80'-81.5'		0.0												
L	8!	s <u> </u>	40%	22/50+	85'-86.5'		0.0	SP-SM	Olive to dark gray poorly sorted sand with silt, moist, slight				10	80	10				
	0.	,	4070	22/30	05 00.5		0.0	31 -31VI	odor				10	00	10				
															1				
H	90	0 —	45%	50-5"	90'-91.5'		38.7	SP-SM	Dark graypoorly graded sand with silt, moist, VOC odor	3	7	10	60	15	5				
															1				
1																			
															1				
F	9	5 –	40%	30/50+	95'-96.5'		450.0	SP-SM	Dark gray poorly graded sand with silt, moist, strong		10	10	60	15	10				
									hydrocarbon odor										
	4.0		F00/	20/50	400 404 5		67.0	c D	Dayle group and the graded conductible grouple	_	10	20	-0	10	١,				
Ī	10	00 -	50%	29/50+	100'-101.5'		67.0	SP	Dark gray poorly graded sand with gravels	5	10	20	50	10	5				
															1				
1															1				
1																			
1															1				
H	10)5 —	35%	20/50+	105'-106.5'		1.7	SP	Dark gray poorly graded sand, moist, slight hydrocarbon odor				20	75	5				
1																			
1															1				
1									First water at 108' - 109' bgs										
1															1				
H	11	.0 —	70%	20/43/50	110'-111.5'		0.0	SP	Dark gray poorly graded sand, wet, slight odor			5	60	30	5				
									_										
1															1				
1																			
L										С	F	С	М	F	FS	D	Т	Р	S
		Field	d Tests	Dilatancy:		id S-Slow I			Plasticity: N - Nonplastic L - Low M - Medium H - High Dry Strength: N - None L - Low M - Meduim H - High V - Very Hi	ah									1
\vdash				Toughness:	L - LOW	M - Medium NOTE: Maxi		Size is dete	Dry Strength: N - None L - Low M - Meduim H - High V - Very High ermined by direct observation within the limitations of sampler size.	БП									\dashv
				NOTE	: Soil identifi				"Standard Practice for Description and Identification of Soils (Visual-Manual Proc	edu	re)"								



BORING NO.

MW-702

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							Visual-Manual Identification & Description	Gra	avel		Sano	t		F	ield	Test	
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
_ 110 _	70%	20/43/50	110'-111.5'		0.0												
— 115 —	100%	13/18/23	115'-116.5'		0.0		Dark gray poorly sorted sand, wet, slight odor Possible heaving sands		3	12	50	30	5				
— 120 —	90%	NA	120'-121.5'		0.0	SP	SAA		3	17	50	25	5				
– 125 –	90%	NA	125'-126.5'		0.0	SP	SAA		3	17	50	25	5				
— 130 —	80%	NA	130'-131.5'		0.0	SP	SAA		3	17	60	15	5				
– 135 –																	
— 140 —	d Tests	Dilatancy:	R - Ron	id S-Slow N	N - None		Plasticity: N - Nonplastic L - Low M - Medium H - High	С	F	С	М	F	FS	D	Т	P	S
Field		Toughness:		M - Medium	H - High		Dry Strength: N - None L - Low M - Meduim H - High V - Very Hi	gh									
<u> </u>		110-	F. Call Idensity				termined by direct observation within the limitations of sampler size.		\!!								4
		NOT	c: Soil identif	cations based	un ASTIVI Meti	1100 DZZ48	"Standard Practice for Description and Identification of Soils (Visual-Manual Pro	ceau	re)"								_

	MUR ronmen					В	ORING LO	G				Ţ			W-	703	3	_
PROJECT		Well Installation	on.						MEI FILE NO.		100	3-001	age -200		1	of	- 5	5
LOCATION		12345 Lakelan		Fe Springs, CA					PROJECT MGR.				quire			_	_	_
CLIENT		Lakeland Deve	and the second second	7. 9. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.					FIELD REP.		_	_	ess/F		Sosio		_	_
CONTRACT	OR	WDC, Montcla							DATE STARTED			3/201	_			_	_	_
DRILLER	77.			s: Ricardo, Bobby					DATE FINISHED		-	15/20	100				_	_
NAME OF TAXABLE	424.77							/ n / n . n . n . n . n . n . n . n . n	TO STATE OF THE ST		-					_	_	=
Elevation	134.73	3 ft. Casing	Datum Samp	ler Core Barrel	Boring L	e & Model		er of Refinery near MW-201 CME 95		D-	illing N	and.	_		Tatal	Dept		_
ltem Tuma		CFA	Samp	NA NA	✓ Truc			✓ Cat-Head	Hammer Type			tonite			TOTAL	Dept	.0	_
Type Inside Diame	ter (in)	5-3/4"	2"	NA.	☐ ATV			Winch	Safety Doughnut	l H	Poly		7		1:	30'		
Hammer Wei		NA	140	1,000	Trac		LUCKS II TO LUCKS IN THE	Roller Bit	✓ Automatic	7	Non				-	,0		
Hammer Fall	-	NA	30		Skid			✓ Cutting Head	Party Volume	ples for	1000	W .	ual ID	only			_	_
rianimer ran	()	, and			OKIC		-				ravel		and	- I		Field	Test	
Depth (ft.)	Recovery %	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	(density/consistence	al-Manual Identification & I cy, color, GROUP NAME & St e, odor, moisture, optional o interpretation)	MBOL, maximum part		П		% Medium	% Fines	Dilatancy	52		Γ
_ 0 _	100%	20/50+	5'		00	ML	Dirt cover Hand auger first Black silts first fir Dark brown silt v		or					80 80 80 75 80 80 80 80 80 80 80 80 80 80 80 80 80				
_ 10 _	95%	9/12/25	10'-11.5'		00	SP-SM	2.5Y 6/3 Light gr	ay poorly sorted sand v	vith silt, dry, no odd	or		í	10 8	0 10)			
— 15 —	95%	7/32/44	15'-16.5'		00	SP-SM	SAA						10 8	0 10)			
— 20 —	95%	15/20/37	20'-21.5'		00	SP	5Y 6/2 Light olive	e gray poorly graded sa	nd, moist, no odor			5	5 9	0 5				

Sample ID Summary Water Level Data Well Diagram Depth in feet to: Riser Pipe **Elapsed Time** CC Cont. Core Screen Boring Depth (Linear ft.) 130 Date Time Stabilized 0,3 (hr.) First Water Thin Wall Tube Filter Sand Sample Method Cal Mod Split Spoon Water Cuttings Undisturbed Sample Number of Samples Split Spoon Sample Grout 3888 BORING NO. G Geoprobe Cuncrete MW-703 111 Bentonite Seal **Field Tests** Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High

> Dry Strength: NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

N - None L - Low M - Meduim H - High V - Very High

Toughness:

L - Low M - Medium H - High

NOTE: Soil identifications based on ASTM Method D2248 "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)"



BORING NO.
MW-703

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							Visual-Manual Identification & Description	Gra	avel		Sand			F	ield	Гest	_
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	a)	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
— 20 —	95%	15/20/37	20'-21 5		0.0												
— 25 —	95%	6/10/20	25'-26.5'		0.0	ML	5Y 4/3 Olive sandy silt, moist, no odor				5	45	50				
— 30 —	95%	23/30/50	30'-31.5'		2.8	ML	5Y 4/2 Olive gray sandy silt, moist, no odor					40	60				
					5.0		Black "asphalt-like"staining at 33.5'										
— 35 —	95%	13/15/21	35'-36.5'		0.0	ML	5Y 4/1 Dark gray silt, moist, no odor					10	90				
— 40 —	15%	8/10/15	40'-41.5'		15.8	SP-SM	5Y 4/2 Olive gray poorly graded sand with silt, moist, slight odor			5	40	45	10				
— 45 —	25%	15/32/50+	45'-46.5'		3.8	SP	5Y 4/2 Olive gray poorly graded sand, moist, slight odor			5	70	20	5				
– 50 –	95%	50+	50'-51.5'		8.6	SP	5Y 6/2 Light olive gray poorly graded sand, moist, slight odor			10	80	10					
Field	l Tests	Dilatancy:		id S - Slow I			Plasticity: N - Nonplastic L - Low M - Medium H - High	C	F	С	М	F	FS	D	Т	Р	S
		Toughness:	L - Low	M - Medium		Size is dete	Dry Strength: N - None L - Low M - Meduim H - High V - Very Hi ermined by direct observation within the limitations of sampler size.	gn	—							_	_



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MW-703

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								Visual-Manual Identification & Description	Gra	evel		Sand	1		F	ield T	est
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well	Diagram	PID (PPM)	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity Strength
— 50 —	95%	50+	50'-51.5'			8.6											
– 55 –	95%	30/50+	55'-56.5'			0.3	ML	7.5Y 4/6 10YR 3/4 Gradual color change in sample core 2.5Y 2/3 Silt					10	90			
— 60 —	95%	50+	60'-61.5'			0.0	SP	5Y 5/8, poorly graded sand				70	20	5			
— 65 —	95%	27/29/40	65'-66 5'			0.4		Staining: amber band 1/4" thick normal to core 2.5Y 6/1 gray well graded sand with silt and gravels, subrounded gravels <1" max size, sand subangular		30	25	20	15	10			
— 70 —	95%	10/20/43	70'-71 5'			0.4	SM	2.5Y 5/1 gray silty sand, subangular				15	70	15			
– 75 –	30%	9/15/33	75'-76.5'			0.1	SP	Olive gray poorly graded sand with silt, moist, VOC odor					90	10			
– 80 –	0%	10/28/43	80'-81.5'			NA		No Recovery	С	F		M	F	FS	D	<u> </u>	PS
Field	d Tests	Dilatancy:				N - None	I.	Plasticity: N - Nonplastic L - Low M - Medium H - High		<u>'</u>	Ŭ					-	J
		Toughness:	L - LOW			H - High imum Particle	Size is det	Dry Strength: N - None L - Low M - Meduim H - High V - Very H ermined by direct observation within the limitations of sampler size.	gı.								
		NOTI	E: Soil identifi	icatio	ns based	on ASTM Metl	hod D2248	"Standard Practice for Description and Identification of Soils (Visual-Manual Pro	cedu	re)"							



BORING NO.
MW-703

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							Visual-Manual Identification & Description	Gra	avel		San	4			Field	Test	
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
— 80 —	0%	10/28/43	80'-81.5'		NA												
– 85 –	30%	19/50+	85'-86.5'		0.0	SP-SM	Grey poorly graded sand with silt, moist, no odor				15	75	10				
— 90 —	30%	42/50+	90'-91.5'		0.0	SW-SM	Grey well graded sand with silt, moist, no odor			30	40	20	10				
— 95 —	50%	40/50+	95'-96.5'		0.0	SW	Gray well graded sand, moist, no odor		5	40	40	10	5				
— 100 —	60%	45/50+	100'-101.5'		0.0	SP	Gray poorly graded sand, moist, no odor	5		15	65	10	5				
— 105 —	30%	24/50+	105'-106.5'		15.2	SP	First water at ~104 Gray poorly graded sand with gravel, wet, hydrocarbon odor	10	25	40) 20	5					
— 110 —	100%	10/15/45	110'-111.5'		17.4	SP	SAA	10 C) 20 M		FS	D	Т	Р	S
Field	d Tests	Dilatancy:	R - Rap	id S - Slow N	N - None	ı	Plasticity: N - Nonplastic L - Low M - Medium H - High		<u> </u>		1	<u> </u>		ت	ــــــــــــــــــــــــــــــــــــــ	<u></u>	Ť
		Toughness:	L - Low	M - Medium			Dry Strength: N - None L - Low M - Meduim H - High V - Very Hi	gh		_						_	_
<u> </u>		NOT	F: Sail identifi				ermined by direct observation within the limitations of sampler size. "Standard Practice for Description and Identification of Soils (Visual-Manual Pro	-pd	re)"	—				—	—	—	4
		NUII	Jon identifi	cations based (JII MƏTIVI IVIET	11JU DZZ48	Standard Fractice for Description and Identification of Soils (Visual-Manual Pro	.cuul	16)								



BORING NO.

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							Visual-Manual Identification & Description	Gra	ivel		Sand			F	ield 1	Test	
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
— 110 —	100%	10/15/45	110'-111.5'		17.4		SAA	10	25	40	20	5					
						SP	111' Gray poorly graded sand, wet , mild hydrocarbon odor		5	20	65	10					
– 115 –	100%	14/20/39	115'-116.5'		1.8	SP	Gray poorly graded sand, wet, mild odor		5	5	80	10					
— 120 —	100%	10/17/21	120'-121.5'		74.1	SP	Gray poorly graded sand, wet, strong odor		5	5	80	10					
– 125 –	100%	10/17/20	125'-126.5'		5.5	ML	Gray sandy silt, moist, mild odor				5	40	55				
— 130 —	75%	8/11/13	130'-131.5'		8.5	ML	SAA				5	40	55				
– 135 –																	
— 140 —								С	F	С	М	F	FS	D	Т	P	S
Field	d Tests	Dilatancy: Toughness:		id S - Slow 1 M - Medium			Plasticity: N - Nonplastic L - Low M - Medium H - High Dry Strength: N - None L - Low M - Meduim H - High V - Very Hi	gh									7
				*NOTE: Max	imum Particle		termined by direct observation within the limitations of sampler size.										╛
L		NOT	E: Soil identifi	cations based	on ASTM Met	hod D2248	"Standard Practice for Description and Identification of Soils (Visual-Manual Pro	cedu	re)"								_

	MUR					В	ORING LOG	Ď					N			NO. 704		
PROJECT	No. of the Control of	N-Net William						MEI FILE NO.		10	00.00	Pag		1		of	5	•
LOCATION		Well Installation 12345 Lakelan		En Springer CA				PROJECT MGR.			03-00 emy				—	_	—	-
CLIENT											_	_	_	0		—	—	-
CONTRACT		Lakeland Deve		rp.				FIELD REP. DATE STARTED			bert		/Fra	ne so	SIC		_	•
DRILLER		WDC, Montcla		s: Ricardo, Bobby	3			DATE STARTED		_	/6/20 /7/20	_			—	—	—	-
BAULTAN - HITCHIS				s. Ricardo, Bobby				Control of the Contro		12	11/20	110			=	_	_	
Elevation	137.93		Datum			Location	Lakeland Rd Loading Rack near MV		_	VV			_					
ltem		Casing	Samp			ke & Model		Hammer Type		rilling			╙	To	tal D	Depth	Ċ.	-
Type		CFA	S 2"		✓ Tru			Safety			ntonit	200			13	O!		
Inside Diame Hammer We	22.1.15	5-3/4" NA	140	1000	☐ AT			□ Doughnut ✓ Automatic	18	No	ymer				13	U		
Hammer Fall	F-100	NA NA	30		Ski				ntinuou		- 177		_		_	_		-
nammer Fall	(m.)	NA	30		SKI	u				Gravel		Sand			_	Field T	est	•
Depth (ft.)	Recovery %	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	Visual-Manual Identific (density/consistency, color, GROUP N/ size*, structure, odor, moisture, c interpret	AME & SYMBOL, maximum pa optional descriptions, geologic	rticle	% Coarse	95	% Medium	% Fine	% Fines	Т	52	Plasticity	Charge subb
- 0 -	80%	N A	5'-10'		00	ML	Asphalt cover Hand auger first 5 feet 10YR 4/5, moist, no odor						20	80				
_ 10 _	80%	NA	10'-15'		00	ML	SAA Color change at 11' to 2.5Y 5/2,	same lithology					20	80				
– 15 –	90%	NA	15'-20'		00	ML	SAA						20	80				
							17' - 18' more consolidated sect	ion with	_	4	┞	Ц	Ц	\dashv	4	\dashv	+	

Losing sand, picking up more silts Water Level Data Sample ID Well Diagram Summary Depth in feet to: Riser Pipe **Elapsed Time** CC Cont. Core Screen Boring Depth (Linear ft.) 130 Time Stabilized Date (hr.) First Water Thin Wall Tube Filter Sand Sample Method Cal Mod Split Spoon Water 0, Undisturbed Sample Cuttings Number of Samples Split Spoon Sample Grout 3888 BORING NO. G Geoprobe Cuncrete MW-704 111 Bentonite Seal **Field Tests** Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High

SM

00

90%

20

20'-25'

NA

Toughness:

vigorous reaction to HCl, poss. Caliche 5Y 6/2 Light olive gray silty sand, moist, no odor

L - Low M - Medium H - High Dry Strength: N - None L - Low M - Medium H - High V - Very High NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

NOTE: Soil identifications based on ASTM Method D2248 "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)"



BORING NO.
MW-704

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### (Pick Recovery (R))								Visual-Manual Identification & Description	Gra	vel	9	and			F	ield	Гest	_
ML 5Y 5/2 sandy silt, moist, no odor 30 70 R L M 30 - 100% NA 30'-35' 0.8 SM SAA ML 10Y 4/3 sandy silt, moist, slight odor 5 25 70 30 - 50% NA 40'-45' 6.2 ML 5Y 4/2 Olive gray silt, moist, slight odor 5 00 5 00 5 5 30 - 50% NA 40'-45' 6.3 SW SAA 10 0.0 SM SY 6/3 well graded sand, moist, slight odor 5 00 5 5 00 10 5 5 0	Depth (ft.)		Blow Counts		Well Diagr	am PID		(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
30 - 100% NA 30'-35' 0.0 SM SAA ML 10Y 4/3 sandy silt, moist, slight odor 5 25 70 35 - 60% NA 35'-40' 9.0 SP 2.5Y 4/3 poorly graded sand, moist, no odor 5 90 5 40 - 50% NA 40'-45' 6.2 ML 5Y 4/2 Olive gray silt, moist, slight odor 10 90 SP 5Y 6/3 poorly graded sand, moist, slight odor 5 80 10 5 45 - 50% NA 45'-50' 8.6 SW 5Y 6/3 well graded sand, moist, slight odor 45 50 5	- 20 -	90%	NA	20'-25		0.0	ML	5Y 5/2 sandy silt, moist, no odor					30	70	R I	L	М	L
ML 10Y 4/3 sandy slit, moist, slight odor 5 25 70 SP 2.5Y 4/3 poorly graded sand, moist, no odor 5 90 5 ML 5Y 4/2 Olive gray slit, moist, slight odor 10 90 SP 5Y 6/3 poorly graded sand, moist, slight odor 5 80 10 5 SP 5Y 6/3 well graded sand, moist, slight odor 45 80 5 5 45 - 60% NA 45'-50' 8.6 SW 5Y 6/3 well graded sand, moist, slight odor 45 80 5 5	- 25 -	80%	NA	25'-30'		0.0	SM	5Y 4/2 Olive gray silty sand, moist, no odor				5	65	30				
35 — 60% NA 35'-40' SP 2.5Y 4/3 poorly graded sand, moist, no odor 5 90 5 ML 5Y 4/2 Olive gray silt, moist, slight odor 5 80 10 5 SP 5Y 6/3 poorly graded sand, moist, slight odor 5 80 10 5 SP 5Y 6/3 well graded sand, moist, slight odor 45 50 5 SW 5Y 6/3 well graded sand, moist, slight odor 10 50 35 5	- 30 -	100%	NA	30'-35'		0.0	SM	SAA										
SP 2.5Y 4/3 poorly graded sand, moist, no odor 5 90 5							ML	10Y 4/3 sandy silt, moist, slight odor				5	25	70				
SP 5Y 6/3 poorly graded sand, moist, slight odor 5 80 10 5 80 10 5 80 10 5 80 5 5 80 6 5 80 6 6 8 8 8 6 8 8 8 6 8	- 35 -	60%	NA	35'-40'		9.0	SP	2.5Y 4/3 poorly graded sand, moist, no odor				5	90	5				
45 - 50% NA 45'-50' 8.6 SW 5Y 6/3 well graded sand, moist, slight odor 50 - 60% NA 50'-55' 9.5 SW SAA 10 50 35 5	- 40 -	50%	NA	40'-45'		6.2	ML	5Y 4/2 Olive gray silt, moist, slight odor					10	90				
50 — 60% NA 50'-55' 9.5 SW SAA							SP	5Y 6/3 poorly graded sand, moist, slight odor			5	80	10	5				
	- 45 -	50%	NA	45'-50'		8.6	SW	5Y 6/3 well graded sand, moist, slight odor				45	50	5				
	- 50 -	60%	NA	50'-55'		9.5	SW	SAA										
Field Tests Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High Toughness: L - Low M - Medium H - High Dry Strength: N - None L - Low M - Medium H - High V - Very High	Field	l Tests							С	F	С	М	F	FS	D	Т	Р	S

NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.



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MW-704

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									Visual-Manual Identification & Description	Gra	avel		Sand			F	ield	est	1
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Wel	II Diag	ram	PID (PPM)	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
– 50 –	60%	NA	50'-55'		Ш		9.5												
												ļ		ļ					
– 55 –	75%	NA	55'-60'				270	ML	5Y 5/2 silt, moist, strong odor					_	95				
_ 33 _	75%	INA	33-00				270	IVIL	31 3/2 siit, moist, strong odor					Э	93				
— 60 —	60%	NA	60'-65'				214	ML	SAA					40	60				
								SP	5Y 6/2 poorly graded sand, moist, strong odor		1	† ⁻	10	85	5				7
									, , , , , , , , , , , , , , , , , , ,										
65	C00/		CE! 70!				227	CD.	544				15		_				
— 65 —	60%	NA	65'-70'				227	SP	SAA				15	80	5				
							445		Staining: 3" dark gray band normal to core										
							434		Staining: 1" dark gray band normal to core										
					Ш														
— 70 —	50%	NA	70'-75'				170	SW	5Y 6/2 well graded sand, moist, strong odor				35	60	5				
— 75 —	50%	NA	75'-80'					sw	SAA				45	50	5				
									Staining: 1/4" amber band normal to core										
— 80 —	50%	NA	80'-85'					sw	SAA				45	50	5				
Eial	d Tests	Dilatanau	D Da=	id c			l None		Placticity: N. Nopplactic J. Low M. Madium H. Uish	С	F	С	М	F	FS	D	Т	Р	S
riei	u IESIS	Dilatancy: Toughness:		М-	- Med	ium	N - None H - High		Plasticity: N - Nonplastic L - Low M - Medium H - High Dry Strength: N - None L - Low M - Meduim H - High V - Very Hi	gh									╛
		NOT	E: Soil identifi						ermined by direct observation within the limitations of sampler size. "Standard Practice for Description and Identification of Soils (Visual-Manual Pro	edu	re)"								\dashv
																			_



BORING NO.
MW-704

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Depth (ft.) Recovery (%) Blow Counts (%) Well Diagram Depth (ft.) PID USCS Symbol Size*, structure, odor, moisture, optional descriptions, geologic interpretation) Well of the property of th	ء ج
Symbol size*, structure, odor, moisture, optional descriptions, geologic interpretation)	Plasticity Strength
- 80 - 50% NA 80'-85'	
— 85 — 50% NA 85'-90' 49.4 SP 5Y 6/2 poorly graded sand, moist, hydrocarbon odor	
- 90 - 50% NA 90'-95' SP SAA	
— 95 — 50% NA 95'-100' 318 SW 5Y 6/1 well graded sand, moist, hydrocarbon odor 45 50 5	
— 100 — 50% NA 100'-105' 423 SP 5Y 5/1 poorly graded sand, moist, hydrocarbon odor 5 60 30 5	
SP SP SY 5/1 poorly graded sand with gravel, moist, hydrocarbon odor 10 25 40 20 5 5 50 40 5	
First water at ~109.5 NA 110'-115' 298 SP 5Y 3/1 poorly graded sand, wet, hydrocarbon odor C F C M F FS D T	PS
Field Tests Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High	
Toughness: L - Low M - Medium H - High Dry Strength: N - None L - Low M - Medium H - High V - Very High NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.	
NOTE: Soil identifications based on ASTM Method D2248 "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)"	



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Depth (ft.) Recovery (%) Blow Counts Sample Depth (ft.) Well Diagram PID USCS Symbol			1					Visual-Manual Identification & Description	Gra	evel		Sand				ield	Test	
### Field Tests Dikipings R Byas S Sow K-Nove Pagiticity N Novoplastic L Low M Medium H High Dry Strongth: N Novoplastic L Low M Medium H High Dry Str	Depth (ft.)		Blow Counts		Well Diagram	PID		(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
= 120 = 70% NA 125-125	110	50%	NA	110'-115'		298	SP	5Y 3/1 poorly graded sand, wet, strong odor			20	75	5					
124 Staining ends 124 Staining ends 125 — 66% NA 125 1307 0.0 ML 5Y 5/3 silt, dry, no odor 5 95 \$ 5 M M 5P SY 3/1 poorly graded sand, wet, no odor 5 0 30 5 5 M M - 130 — Field Tests Dilatancy: 8 - Rapid 5 - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High Toughness: L - Low M - Medium H - High Toughness: N - None L - Low M - Medium H - Hig	— 115 —	70%	NA	115'-120'		702	SP	SAA, angular to subangular grains			20	75	5					
Field Tests Dilatancy: R-Rapid S-Slow N-None Plasticity: N-Nonplastic L-Low M-Medium H-High N-Medium H-High N-None L-Low M-Medium H-High N-None L-How M-Medium H-High N-No	120	70%	NA	120'-125'		38.6	ML	Gley1 3/5G silt, moist, staining					5	95	S		М	М
Sp 5Y 3/1 poorly graded sand, wet, no odor																		
Field Tests Dilatancy: Toughness: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High Toughness: R - Rapid S - Slow N - None Plasticity: N - None L - Low M - Medium H - High N - Worty High Toughness: N - None L - Low M - Medium H - High N - Worty High Toughness: N - None L - Low M - Medium H - High N - Worty High Toughness: N - None L - Low M - Medium H - High N - Worty High Toughness: N - None L - Low M - Medium H - High N - Worty High Toughness: N - Worty High	— 125 —	60%	NA	125'-130'		0.0	ML	5Y 5/3 silt, dry, no odor					5	95	S		М	М
Field Tests Dilatancy: R - Rapid S - Slow N - None Toughness: L - Low M - Medium H - High Dry Strength: N - Nonplastic L - Low M - Medium H - High V - Very High *NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.	— 130 —					0.0				5	60	30	5					
Field Tests Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High Toughness: L - Low M - Medium H - High Provided Bize is determined by direct observation within the limitations of sampler size.	— 135 —																	
Toughness: L - Low M - Medium H - High Dry Strength: N - None L - Low M - Meduim H - High V - Very High *NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.		Jane	Dilate						С	F	С	М	F	FS	D	Т	Р	S
	Field	ı iests			M - Medium	H - High	_	Dry Strength: N - None L - Low M - Meduim H - High V - Very Hi	gh									
				F. C. 71.1							_						_	4

	MUI	REX				-	ODING	v.c.				П				G NO	
3333	ronmen					В	ORING LC)G				L		M	W-	70	5
-900000		95-35-2 (8)/915-1							AACLEUC NO		400		age		1	of	5
PROJECT LOCATION		Well Installation		Ee Springs CA					MEI FILE NO. PROJECT MGR.			_	l-200 quire				—
CLIENT		Lakeland Deve							FIELD REP.		100	ne So					
CONTRAC	FOR	WDC, Montcla		μ.					DATE STARTED			13/20					
DRILLER	Commo.	Lead driller: Ea	The state of the s	s: Ricardo, Bob	by				DATE FINISHED			14/20	-				
Elevation	139.1		Datum			Location	Refinery near	MW-202	Section of the sectio	_							=
ltem	193,1	Casing	Samp	ler Core Bar		ke & Model		CME 95	Hammer Type	Dr	illing f	Mud	Т		Total	Dept	th
Туре		CFA	S	NA	√ Tr	uck	Tripod	✓ Cat-Head	Safety		Beni	tonite			- 276	92.80.7	
Inside Diame	10.1.15	5-3/4"	2"		AT	v [Winch	Doughnut		Poly				1	30'	
Hammer We		NA	140					Roller Bit	✓ Automatic	4	Non	-					
Hammer Fall	(in.)	NA	30		Sk	id		✓ Cutting Head		nples for	visua ravel	_	ual ID and	only		Field	Test
Depth (ft.)	Recovery %	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	(density/consister	ual-Manual Identification & I ncy, color, GROUP NAME & S\ ire, odor, moisture, optional (interpretation)	MBOL, maximum par		П	Q.	% Medium	A Hine	Dilatancy	8	
0 -							Dirt cover	***************************************		Ť	9.	9.				_	
							Diff cover				П			Т	ı		ΙI
							Hand auger firs	t 5 feet			П			Т	ı		ıl
											П			Т	ı		ΙI
											П			Т	ı		ΙI
											П			Т	ı		ΙI
											П			Т	ı		ΙI
							Janes III				П			ь	ı		ΙI
- 5 -	100%	10/12/2013	5'		0.0	ML	Dark brown silt	with sand, moist, no ode	or		11		3	0 7	D		ΙI
_											П			1	1		ΙI
											П			Т	ı		ΙI
											П			Т	ı		ΙI
											П			Т	ı		ΙI
											П			Т	ı		ΙI
						 					$\bot \bot$				上	L.	\sqcup
											П			Т			ΙI
- 10 -	90%	6/7/8	10'-11.5'		00	SP-SM	Light brown po	orly graded sand with sil	t, moist, no odor		П	3	5 8	5 1	D		ΙI
											11			П	1		ΙI
											П			Т	ı		ΙI
											П			Т	ı		ΙI
											П			Т	ı		ΙI
							l										
							l										
															1		
15	80%	25/30/38	15'-16.5'		00	SP	OI:		-				5 9	ю 5			
							Olive gray poor	ly graded sand, moist, no	odor						1		
						1	l							1			
_ 20 _	70%	17/26/35	20'-21.5'		00	SD-SAA	Olive gray poor	ly graded sand with silt,	moist no odor				10 8	10	n		
20	7.570	11/20/33	20 21.3		0.0	31-3141	Clive gray poor	y 61 aucu sanu with Silt,	moist, no outi	Ļ						Ļ	Ļ
		Water Lev	val Data				Sample ID	Well Diagram		C		mma		F	D		P
		water Lei	vei Data	Depth in feet		_	sample to	Riser Pipe			эu	HIH	ı y				

Split Spoon Sample Grout 3888 Cuncrete BORING NO. G Geoprobe MW-705 111 Bentonite Seal Field Tests Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High Toughness: L - Low M - Medium H - High Dry Strength: N - None L - Low M - Meduim H - High V - Very High

Undisturbed Sample

Cont. Core

Thin Wall Tube

CC

Stabilized

Water

Elapsed Time

(hr.)

First Water

Time

Date

NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

Screen

Filter Sand

Cuttings

0,3

Boring Depth (Linear ft.)

Sample Method

Number of Samples

130'

Cal Mod Split Spoon



BORING NO.

MW-705

			1				Visual-Manual Identification & Description	Gra	avei	,	Sand			F	ield	Test
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well Diagram	n PID	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity
_ 20 —	70%	12/26/35	20'-21 5		0.0											
- 25 —	70%	29/50+	25'-26.5'		0.0	SP	Light gray poorly graded sand, dry, no odor				75	20	5			
30 —	60%	11/25/27	30'-31.5'		0.0	SP	Dark gray poorly graded sand, moist, no odor 32'-34' more consolidated section with vigorous reaction to			5	80	10	5			
- 35 -	95%	9/20/24	35'-36.5'		0.0	ML	5Y 4/1 Dark gray sandy silt, moist, no odor				5	25	70			
- 40 -	80%	12/21/32	40'-41.5'		0.0	ML	SAA				5	30	65			
- 45 -	65%	12/25/30	45'-46.5'		0.0	SP	Dark gray poorly graded sand, moist, no odor			5	80	10	5			
- 50 -	30%		50'-51.5'		0.0	SP	SAA			5	80	10	5			



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MW-705

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								Visual-Manual Identification & Description	Gra	avel	:	Sand	ı		F	ield T	est
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Wel	l Diagr	am PID (PPM)	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity Strength
- 50 -	30%		50'-51.5'			0.0	SP										
– 55 –	- 65%		55'-56.5'			0.0		Olive gray poorly graded sand, dry, no odor 2.5Y 2/3				80	15	5			
— 60 —	50%	13/31/38	60'-61.5'			0.0	SP	Gray poorly graded sand, dry, no odor			5	75	15	5			
— 65 —	70%	21/29/38	65'-66.5'			0.0	SP	Olive gray poorly graded sand, moist, no odor			5	75	15	5			
– 70 –	- 55%	28/45/45	70'-71 5'			0.0	SP	Dark gray poorly graded sand, moist, slight tar odor		5	10	60	20	5			
— 75 —	- 60%	20/37/50+	75'-76.5'			0.0	SP	Gray poorly graded sand, moist, slight tar odor			10	65	20	5			
— 80 —	- 70%	7/20/30	80'-81.5'			0.0	ML	Dark olive gray sandy silt, moist, no odor					30				D. C
Fiel	d Tests	Dilatancy:				/ N - None	1	Plasticity: N - Nonplastic L - Low M - Medium H - High		r	С	IVI	r	۲5	D	1	P S
		Toughness:	L - Low			um H - High Iaximum Particl	e Size is det	Dry Strength: N - None L - Low M - Meduim H - High V - Very H ermined by direct observation within the limitations of sampler size.	ıgn								
		NOT	E: Soil identifi					"Standard Practice for Description and Identification of Soils (Visual-Manual Pro	cedu	re)"							



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Second Procession Process								Visual-Manual Identification & Description	Gra	avel		Sand				Field 1	Test	
### 20	Depth (ft.)		Blow Counts		Well Diagram	PID		(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
Dark gray poorly graded sand with silt, moist, strong odor, noticeable staining 100 - 75% 9/50- 107-101-5' 1734 ML Dark gray sandy silt, moist, strong odor 5 5 5 15 70 110 - 75% 9/50- 107-101-5' 2.9 ML Greenish/olive gray silt with sand, moist, slight odor 5 5 5 15 70 110 - 90% 9/19/30 116'-111-5 0.0 ML Dark gray sandy silt, wet, no odor 5 5 5 20 70 First water at ~109 Dark gray sandy silt, wet, no odor 5 5 5 20 70 First water at ~109 Dark gray sandy silt, wet, no odor 5 5 5 20 70 First water at ~109 Dark gray sandy silt, wet, no odor 5 5 5 20 70 First water at ~109 Dark gray sandy silt, wet, no odor 5 5 5 20 70 No.							ML	Greenish gray silt with sand, moist, no odor										
- 100 - 75% 9/50+ 100·101.5'	— 90 —	40%	17/31/50	90'-91.5'		199	ML	Dark gray sandy silt, moist, strong odor, noticeable staining				5	25	75				
- 105 - 100% 19/37/32 105'-106.5' 2.9 ML Greenish/olive gray silt with sand, moist, slight odor First water at ~109 First water at ~109 Dark gray sandy silt, wet, no odor Field Tests Dilatancy: Toughness: R-Rapid S-Slow N-None Plasticity: Dry Strength: N-None L-Low M-Medium H-High Dry Strength: N-None L-Low M-Medium H-High V-Very High NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.	— 95 —	20%	16/32/50	95'-96.5'		151	SP-SM				5	60	25	10				
First water at ~109 90% 9/19/30 110'-111.5' 0.0 ML Dark gray sandy silt, wet, no odor Field Tests Dilatancy: R - Rapid S - Slow N - None Toughness: L - Low M - Medium H - High Dry Strength: N - None L - Low M - Medium H - High V - Very High NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.	— 100 —	75%	9/50+	100'-101.5'		1734	ML	Dark gray sandy silt, moist, strong odor		5	5	5	15	70				
- 110 - 90% 9/19/30 110'-111.5' 0.0 ML Dark gray sandy silt, wet, no odor 5 5 5 20 70 0 0.0 ML Dark gray sandy silt, wet, no odor 5 5 5 20 70 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	— 105 —	100%	19/37/32	105'-106.5'		2.9	ML	Greenish/olive gray silt with sand, moist, slight odor					25	75				
Field Tests Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High Toughness: L - Low M - Medium H - High Dry Strength: N - None L - Low M - Medium H - High V - Very High NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.	— 110 —	90%	9/19/30	110'-111.5'		0.0	ML		С	F						Т	P	S
NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.	Field	d Tests					•						-				•	٦
			roughness:	L - Low			Size is dete		gn									\dashv
			NOTI	E: Soil identifi					edu	re)"						_		J



BORING NO.

MW-705

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							Visual-Manual Identification & Description	Gra	vel		Sand			F	ield	Гest
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity
110 —	90%	9/19/30	110'-111.5'		0.0	ML	Dark gray sandy silt, wet, no odor			5	5	20	70			
115 —	90%	8/17/20	115'-116.5'		0.0	SP	Dark gray poorly graded sand, wet, no odor		5	5	60	25	5			
120 —	80%	10/16/50	120'-121.5'		0.0	SP	SAA		5	10	70	10	5			
125 —	70%		125'-126.5'		0.0	SP	SAA		5	25	55	10	5			
130 —	80%		130'-131.5'		0.0	SP	SAA		10	50	30	10				
135 —	90%		133.5-135		0.0	SP	SAA		10	50	30	10				
140 —																
								С	F	С	М	F	FS	D	Т	Р

envi	MUI	REX ntal, inc				В	ORING LOG					Ţ		M	ORIN 1W	-70	06	
ODOLECT		187-II (4-II-4:-							MELEUENO		100		age	_	1	of	f	5
PROJECT LOCATION		Well Installation		En Carinar CA					MEI FILE NO. PROJECT MGR.				L-200 quire			—	_	_
Carlotte Spring and Street		12345 Lakelan									_	_	_	_	- 0		—	
CLIENT	FOR	Lakeland Deve		p.					FIELD REP.					Idili	e Sos	IC	_	_
CONTRACT DRILLER	TOR	WDC, Montcla		e: Dieseda Babbu	3				DATE STARTED DATE FINISHED			9/201	1114	—			—	
UKILLEK		Lead driller. Ea		s: Ric <mark>ard</mark> o, Bobby					DATE FINISHED		12/.	10/20	10	_	_	_	_	_
Elevation	139.6		Datum		Boring L		Refinery near MW-10	A STATE OF THE STA										
ltem		Casing	Sampl	_		e & Model		ИЕ 95	Hammer Type		illing N		+	_	Tota	al Dep	pth	
Type	ALUKU Y	CFA	S	NA	✓ Truc				Safety			tonite	ů.		1	32	1	
Inside Diame Hammer We		5-3/4" NA	2" 140	NA.	Trac		STORY MANAGEMENT	Winch Roller Bit	Doughnut Automatic		Poly				1	JZ		
Hammer Fall		NA NA	30		Skid		100000000000000000000000000000000000000	100 May 2 - 110	DECISION OF THE PERSON OF THE	ples for	1000	W.	mal If) on	lv		_	_
ridinine rdi	(m.)	130	50	·	JKIC				-		ravel		and	T	"	Fie	ld Te	st
Depth (ft.)	Recovery %	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	(density/consistency, col		A STATE OF THE PARTY OF THE PAR		П		mn	% Ene	% Fines	92	2	Chronith
_ 5 _	100%	9/19/2016	5'		1.3	ML	Dirt cover Hand auger first 5 fee 7.5Y 4/3 Brown, mois						а	30 7	770			
_ 10 _	80%	7/16/20	10'-11.5'		00	SP	2.5Y 4/2 Dark garyish odor	brown poorly gra	aded sand, dry, no				5 9	90	5			
— 15 —	80%	11/23/50+	15'-16.5'		00		2.5Y 6/1 Gray poorly grains, moist, no odo		angular-subrounded			10	70 1	L5	5			
	7502		201 24 51				2.5Y 5/1 Gray poorly	graded sand,suba	angular - subrounded									

20	7570	15/23/33	-21.5	0.0	Jr	grains dry no odor			CIF	C M F FS D T P
		Water Level D	ete			Sample ID		Well Diagram	S	ummary
			Depth i	feet to:	1000	-19		Riser Pipe	AND THE PERSON NAMED IN COLUMN	No.
Date	Time	Elapsed Time (hr.)	First Water	Stabilized Water	T CC	Cont. Core Thin Wall Tube Undisturbed Sample Solit Spoon Sample	121 152 153	Screen Filter Sand Cuttings Grout	Boring Depth (Linear ft.) Sample Method Number of Samples	132' Cal Mod Split Spoon
					G	Geoprobe		Cuncrete Bentonite Seal	BORING NO.	MW-706
Field 1	- I	ilatancy: oughness:	The second secon	llow N - None edium H - High		Plasticity: Dry Strength:		The state of the s	Low M - Medium H - High M - Meduim H - High V - N	/ery High

NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.



BORING NO.

MW-706

							Visual Manual Identification 9 Description	Gra	evel	-	Sand	1	ı	F	ield Te	est
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	Visual-Manual Identification & Description (density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines		Toughness	
20	75%	19/23/33	20'-21 5		0.0	SP	2.5Y 5/1 Gray poorly graded sand, subangular - subrounded grains dry, no odor				70		5			
— 25 —	75%	11/22/38	25'-26.5'		0.0	SP	SAA			5	75	15	5			
— 30 —	100%	13/43/38	30'-31.5'		0.0	ML	5Y 4/2 Olive gray sandy silt, dry, no odor				5	20	75			
– 35 –	• 0%	13/18/21	35'-36.5'		NA		No Recovery: sampler lost down-hole									
— 40 —	95%	20/33/38	40'-41.5'		0.0	ML	2.5Y 4/4 Olive brown silt with sand, dry, no odor					25	75			
– 45 –	95%	16/20/30	45'-46.5'		0.0	SP	2.5Y 5/6 Light olive brown poorly graded sand, dry, no odor				80	15	5			
– 50 –	75%	27/50+	50'-51.5'		0.0	SP	5Y 5/3 Olive poorly graded sand, dry, no odor	С	F			30				
Field	d Tests	Dilatancy:		id S - Slow		<u> </u>	Plasticity: N - Nonplastic L - Low M - Medium H - High		r	С	М	F	FS	D	TP	5
		Toughness:	L - LOW	M - Medium		Size is dete	Dry Strength: N - None L - Low M - Meduim H - High V - Very Hi rmined by direct observation within the limitations of sampler size.	RII								
		NOTE	: Soil identific	ations based o	on ASTM Meth	od D2248	"Standard Practice for Description and Identification of Soils (Visual-Manual Proc	edur	e)"						_	



BORING NO.
MW-706

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								Visual-Manual Identification & Description	Gra	avel		Sand			F	ield 1	est
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well	Diagra	m PID (PPM)	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity Strength
— 50 —	75%	27/50+	50'-51.5'			0.0	SP	5Y 5/3 Olive poorly graded sand, dry, no odor				65	30	5			
— 55 —	75%		55'-56.5'			0.0	SP	Gley1 4/10Y poorly graded sand, dry no odor				80	15	5			
— 60 —	75%	21/33/41	60'-61.5'			0.0	SP	Gley1 5/10Y Greenish gray poorly graded sand, dry, no odor				65	30	5			
– 65 –	60%	12/29/50+	65'-66.5'			0.0	SM	5Y 4/2 Olive gray silty sand, dry, no odor					60	40			
— 70 —	30%	14/50+	70'-71.5'			0.0	SP	Gley1 5/5GY Dark greenish gray poorly graded sand				65	30	5			
– 75 –	75%	12/29/50+	75'-76.5'			0.2	SP	Gley1 4/10GY Dark greenish gray poorly graded sand				20	70	10			
– 80 –	0%	23/50+	80'-81.5'			NA		No Recovery	С	F	С	M	F	FS	D	Т	P S
Fiel	d Tests	Dilatancy: Toughness:				N - None m H - High		Plasticity: N - Nonplastic L - Low M - Medium H - High Dry Strength: N - None L - Low M - Meduim H - High V - Very Hi	gh								
				NC	OTE: Ma	aximum Particle		ermined by direct observation within the limitations of sampler size.									_
		NOT	E: Soil identifi	cation	ns base	d on ASTM Meti	nod D2248	"Standard Practice for Description and Identification of Soils (Visual-Manual Pro	cedu	re)"							



BORING NO.
MW-706

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Person No. Per								Visual-Manual Identification & Description	Gra	avel		Sano			F	ield T	est
### 20	Depth (ft.)		Blow Counts		Well Diagram	PID		(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity Strength
Solution 1794 1794 1895-1805 1897-1915 1898 1997-1915 1997-191	80 -	0%	23/50+	80'-81.5'		NA		No Recovery									
### 95 - 60% 27/59+ 95-96.5' 87.5 SM Gley1 5/N silty sand, moist, odor 10 70 20 ### 100 - 50% 50+ 100-101.5' 0.8 SM Gley1 4/5G silty sand, moist, slight odor 60 40 ### 100 - 75% 50+ 105-106.5' 1.2 SM SAA 60 40 ### 28/50- 110-111.5' 0.2 SP Gley1 3/5G Dark greenish gray poorly graded sand, wet 5 70 20 5 ### 100 - 75% 28/50- 110-111.5' 0.2 SP Gley1 3/5G Dark greenish gray poorly graded sand, wet 5 70 20 5 ### 100 - 75% Dilatancy: R-Rapid S-Slow N-None	– 85 –	- 15%	17/50+	85'-86.5'		1.1	SM					25	50	25			
## 100 = 50% 50+ 100*-101.5* 0.8 SM Gley1 4/5G silty sand, moist, slight odor 60 40	– 90 –	30%	50+	90'-91.5'		0	sw	5Y 5/2 well graded sand with gravels max size 2"	20	20	20	20	20	Т			
## 105 - 75% 50+ 105'-106.5' 1.2 SM SAA First water at ~110	– 95 –	- 60%	27/50+	95'-96.5'		87.5	SM	Gley1 5/N silty sand, moist, odor				10	70	20			
First water at ~110 0.2 SP Gley1 3/5G Dark greenish gray poorly graded sand, wet 5 70 20 5 C F C M F FS D T P S Field Tests Dilatancy: R - Rapid S - Slow N - None Toughness: L - Low M - Medium H - High Dry Strength: N - None L - Low M - Medium H - High V - Very High NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.	— 100 —	- 50%	50+	100'-101.5'		0.8	SM	Gley1 4/5G silty sand, moist, slight odor					60	40			
- 110 - 75% 28/50+ 110'-111.5' 0.2 SP Gley1 3/5G Dark greenish gray poorly graded sand, wet 5 70 20 5 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	– 105 –	75%	50+	105'-106.5'		1.2	SM	SAA					60	40			
Field Tests Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High Toughness: L - Low M - Medium H - High Dry Strength: N - None L - Low M - Meduim H - High V - Very High NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.	_ 110 _	75%	28/50+	110'-111.5'		0.2	SP		С	F					D	Т	P S
NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.	Fiel	d Tests								•			_		<u> </u>		
			rougnness:	L - LOW			Size is dete		gn				—				
·			NOTE	: Soil identifi					edu	re)"							



BORING NO.

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Visual-Manual Identification & Description Pied Te: Visual-Manual Identification & Description
Depth (ft.) Recovery (%) Blow Counts (%) PID USCS Symbol Size*, structure, odor, moisture, optional descriptions, geologic interpretation) Interpretation (density/consistency, color, GROUP NAME & SYMBOL, maximum particle of the property o
- 110 - 75% 28/50+ 110'-111.5' 0.2 SP Gley1 3/5G Dark greenish gray, wet
From 110' to 132' color gradually changes from greenish hue to blueish hue NA 115'-116.5' NA SP SAA 5 70 20 5
- 120 - NA 120'-121.5' NA SP SAA
- 125 - NA 125'-126.5' NA SP Gley2 4/5BG
NA 130'-131.5' NA ML Gley2 4/5BG silt, dry, no odor 10 90
- 135 -
Field Tests Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High Toughness: L - Low M - Medium H - High Dry Strength: N - None L - Low M - Medium H - High V - Very High
*NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.
NOTE: Soil identifications based on ASTM Method D2248 "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)"

envi	MUF	REX Ital, inc				В	ORING LOG	Î							ING V-7			
PROJECT		Well Installation	-					MEI FILE NO.		100		Page	7.11	1		of	5	5
LOCATION		12345 Lakelan		Fe Springs CA				PROJECT MGR.			3-00 emy :			_	—	_	_	_
CLIENT		Lakeland Deve						FIELD REP.		100	ne Sc	_	e		—	—	_	_
CONTRACT	TOP.	WDC, Montcla		μ.				DATE STARTED			20/2			_	_	_	_	_
DRILLER	OK		The state of the s	s: Ricardo, Bobby				DATE FINISHED			23/2	- A			—	—	_	_
COLORE OF COM.	-			s. Ricardo, Bobby				_ DATE HINSHED		12/	25/2	010			=	=	=	=
Elevation	128.8	7. 1100	Datum		Boring L		Getty Drive southeast of MW-503B		_	test .		_		_			_	_
Item		Casing	Samp	_		e & Model	_	Hammer Type	Dr	illing		-		10	otal D	epth	1	_
Type Incide Diamo	tor lin 1	CFA E 2/4"	S 2"	NA NA	✓ Truc	k		Safety	ΙH		tonit	e			13	C!		
Inside Diame Hammer Wei	3.1 15 3.5	5-3/4" NA	140	1000	Trac			□ Doughnut ✓ Automatic		Non	mer				13	3		
Hammer Fall	-	NA NA	30		Skid				nples for		10	nual	ID o	nlu	—	_	_	_
nammer Fall	(m.)	NA	50		SKIU					ravel		Sand		ηγ	-	ield T	Test	
Depth (ft.)	Recovery %	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	Visual-Manual Identification (density/consistency, color, GROUP NAME size*, structure, odor, moisture, optic interpretation	& SYMBOL, maximum par nal descriptions, geologic			% Coarse	% Medium	% Fine	% Fines	Т	60	Plasticity	Г
_ 0 <u>_</u>	100%	7/8/2016	5'		0.0	ML	4" Asphalt Hand auger first 5 feet Light brown silt with sand, moist, no	odor					25	75	18			
_ 10 _	90%	8/50+	10'-11.5'		00	ML	Light garyish brown sandy silt, moist	, no odor					30	70				
– 15 –	70%	41/50+	15'-16.5'		00	SM	Brown silty sand, moist, no odor					5	60	35				
_ 20 _	75%	23/30/37	20'-21.5'		00	SM	Light brown silty sand, moist, no od	or				10	70	20				

Sample ID Water Level Data Well Diagram Depth in feet to: Riser Pipe **Elapsed Time** CC Cont. Core Screen Boring Depth (Linear ft.) 135 Date Time Stabilized 0, 1 (hr.) First Water Thin Wall Tube Filter Sand Sample Method Cal Mod Split Spoon Water Cuttings **Undisturbed Sample** Number of Samples Split Spoon Sample Grout 3888 Cuncrete BORING NO. G Geoprobe MW-707 111 Bentonite Seal **Field Tests** Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High

> Dry Strength: NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

N - None L - Low M - Meduim H - High V - Very High

Toughness:

L - Low M - Medium H - High



BORING NO.

MW-707

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							Visual-Manual Identification & Description	Gra	avel		Sand			F	ield	Test	
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well Diagr	ram PID	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
_ 20 -	75%	23/30/37	20'-21 5		0.0	SM	Light brown silty sand, moist, no odor				10	70	20				
— 25 –	- 65%	17/23/28	25'-26.5'		0.0	SM	Olive brown silty sand, moist, no odor				5	65	30				
- 30 -	95%	12/17/20	30'-31.5'		2.3	ML	Light brown sandy silt, with gray and reddish mottling			3	7	20	70				
— 35 -	- 50%	18/23/32	35'-36.5'		1.5	SM	Dark gray silty sand, moist, slight odor				5	80	15				
— 40 -	- 30%	28/50+	40'-41.5'		1.4	SP	Light gray poorly graded sand, dry, no odor			5	50	40	5				
						ML	44' Dark gray sandy silt, moist, slight odor				5	40	55			+	_
- 45 -	50%	14/21/50	45'-46.5'		5.9	SP	Light gray poorly graded sand, moist, slight odor				80	15	5				
						ML	49' Light brown silt with sand, moist, no odor			-		20	80			$\frac{1}{1}$	\exists
- 50 -	40%	25/27/29	50'-51.5'		18.1	SP	Gray poorly sorted sand, moist, slight odor		5	20	50	20	5				
Eio	ld Tests	Dilatancy:	D Dan	id S Slav	w N - None		Plasticity: N - Nonplastic L - Low M - Medium H - High	С	F	С	М	F	FS	D	T	Р	S
Fie	10303	Toughness:		M - Medi	um H - High	Cina in der	Dry Strength: N - None L - Low M - Meduim H - High V - Very Hi	gh								_	_
		NOTE	: Soil identific				ermined by direct observation within the limitations of sampler size. "Standard Practice for Description and Identification of Soils (Visual-Manual Proc	edur	e)"							_	\exists
																	_



BORING NO.
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									Visual-Manual Identification & Description	Gra	avel		Sano	ļ.			ield 1	rest
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Wel	I Diag	ram	PID (PPM)	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity
- 50 -	40%	25/27/29	50'-51 5'				18.1	SP	Gray poorly graded sand, moist, slight odor		5	20	50	20	5			
— 55 —	90%	23/25/27	55'-56.5'				13.8	SM	Dark gray silty sand, moist, slight odor			2	18	60	20			
— 60 —	85%	13/17/20	60'-61.5'				58.9	ML	Light brown sandy silt, moist, slight odor				10	20	70			
— 65 —	70%	24/50+	65'-66.5'				42.5	SP-SM	Greenish gray poorly graded sand with silt, moist, slight odor			5	10	75	10			
— 70 —	60%	32/50+	70'-71 5'				8.7	SP	Light gray poorly graded sand, moist, no odor			5	50	40	5			
— 75 —	35%	35/50+	75'-76.5'				19.6	SP	Olive gray poorly graded sand, moist, slight odor			10	50	35	5			
— 80 —	35%	35/50+	80'-81.5'				315	SP	Light gray poorly graded sand, moist, hydrocarbon odor	С	F		60 M			D	Т	P
Field	d Tests	Dilatancy: Toughness:	R - Rap L - Low				- None H - High		Plasticity: N - Nonplastic L - Low M - Medium H - High Dry Strength: N - None L - Low M - Meduim H - High V - Very H	igh								
				N	OTE: N	Vlaxir	num Particle		ermined by direct observation within the limitations of sampler size.									
		NOT	E: Soil identifi	catio	ns ba	sed o	n ASTM Meth	od D2248	"Standard Practice for Description and Identification of Soils (Visual-Manual Pro	cedu	re)"							



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								Visual-Manual Identification & Description	Gra	avel		Sano	d			Field	Test	
De	epth (ft	Recover	Blow Counts	Sample	Well Diagram	PID	uscs	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle	a,		a)	Ę			>	SSS	`	_
ľ	.pcii (ii	., (%)	Diow counts	Depth (ft.)	Well Diagram	115	Symbol	size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
<u> </u>						1		interpretation)	%	%	1			1	i –	Tor	Pla	Str
H	80	35%	35/50+	80'-81.5'		315	SP	Light gray, moist, hydrocarbon odor		}	5	60	30	5				
										}								
										}								
										}								
										}								
H	85	55%	50+	85'-86.5'		2000+	SP	Dark gray poorly graded sand, moist, strong odor		}	10	60	25	5				
										}								
										}								
										}								
		2		001 5 : =-				Pod an all made at the state of						L				
r	90	50%	50+	90'-91.5'		128	SM	Dark gray silty sand, moist, strong odor	1			10	60	30				
										}								
L	95	50%	50+	95'-96.5'		193.6	SP-SM	Gray poorly graded sand with silt, moist, hydrocarbon odor			10	40	40	10				
	33	30%	301	95-90.5		155.0	SF-SIVI	laray poorty graded sand with sitt, moist, hydrocarbon odor			10	40	40	10				
										}								
										H	┢	╁		1				-
L	100	45%	50+	100'-101.5'		130.8	ML	Dark brown sandy silt, moist, hydrocarbon odor				5	40	55				
										}								
									\vdash	\forall	\vdash	 		1	┢			\dashv
				[1				
				[1				
				[1				
H	105	50%	50+	105'-106.5'		77.4	SP	Dark gray poorly graded sand, moist, hydrocarbon odor	1	10	25	40	20	5				
				[1				
				[1				
1									ĺ									
				[First water at 0110						1				
				[First water at ~110						1				
														1				
r	110	60%	8/25/28	110'-111.5'		84.6	SP	SAA, wet		15	20	55	10	1				
1									ĺ									
									С	F	С	M	F	FS	D	Т	Р	S
r	Fi	eld Tests	Dilatancy:		id S - Slow I		•	Plasticity: N - Nonplastic L - Low M - Medium H - High			<u> </u>		<u> </u>		<u></u>			ヿ
H			Toughness:	L - Low	M - Medium NOTE: Maxi		Size is det	Dry Strength: N - None L - Low M - Meduim H - High V - Very Hi ermined by direct observation within the limitations of sampler size.	gh	—	—	—						\dashv
			NOT	E: Soil identifi				"Standard Practice for Description and Identification of Soils (Visual-Manual Pro	cedu	re)"	_							
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BORING NO.

MW-707

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							Visual-Manual Identification & Description	Gra	avel		Sano	1			Field	Test	
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
- 110 -	60%	8/25/28	110'-111.5'		84.6	SP	SAA, wet		15	20	55	10					
- 115 -	80%	13/19/42	115'-116.5'		345.0	SP	Dark gray poorly graded sand, wet, hydrocarbon odor	2	8	50	25	10	5				
– 120 –	75%	45/50+	120'-121.5'		83.5	ML	Brown sandy silt with red and orange mottling, wet, hydrocarbon odor, dark gray staining				5	35	60				
- 125 -	60%	13/15/32	125'-126.5'		6.1	ML	Dark gray sandy silt, wet, hydrocarbon odor				5	55	40				
– 130 –	60%	50+	130'-131.5'		6.7	ML	Olive brown sandy silt, wet, hydrocarbon odor	2	3	2	8	20	65				
– 135 –	70%	50+	133.5'-135'		11.2	SP-SM	Olive gray poorly graded sand with silt, wet, slight hydrocarbon odor		3	7	60	20	10				
– 140 –								С	F	С	М	F	FS	D	Т	P	S
Fiel	d Tests	Dilatancy:		id S - Slow N		I.	Plasticity: N - Nonplastic L - Low M - Medium H - High		<u> </u>	<u> </u>	1	<u> </u>		ت	•	•	_
		Toughness:	L - Low	M - Medium		Cina is al.	Dry Strength: N - None L - Low M - Meduim H - High V - Very Hi	gh	_	_	_	_	_				_
		NOT	T. Call Idameis				termined by direct observation within the limitations of sampler size. "Standard Practice for Description and Identification of Soils (Visual-Manual Pro		ro\"								_

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	ironmer					В	ORING LO	JG							N	W	-70	8
71070	and the state of t	en-area months								MEI FILE NO.		400		Page		1	of	5
PROJECT LOCATIOI	N.	Well Installation		e Springs CA						PROJECT MGR.		_	_	1-200 quir				
CLIENT		Lakeland Deve								FIELD REP.		1000	ie So		_			
CONTRAC	TOR	WDC, Montcla		p.						DATE STARTED			1/20					
DRILLER				s: Ricardo, Bobby	¥					DATE FINISHED		-	2/20	_				
Elevation	126.7		Datum		_	Location	Hospital near	MW-601/		To a second visit of the second second								_
ltem	120.7	Casing	Sampl	ler Core Barrel		ke & Model		CME		Hammer Type	Dri	lling N	Aud	Т		Tota	l Dep	oth
Туре		CFA	S	NA	₹ Tru			J	Cat-Head	Safety	П		tonite					- 1
Inside Diam	eter (in.)	5-3/4"	2"	NA.	☐ ATN	v [Winch	Doughnut		Poly	mer	11/		1	30	8
Hammer W	-	NA	140		Tra				Roller Bit	✓ Automatic	J	Non						
Hammer Fa	II (in.)	NA	30		Skid	d	Hand Auger	J	Cutting Head	Drilling Notes: San	ples for				D on	γ		
							AND THE RESERVE TO A PROPERTY OF THE PERSON		al Identification &			avel	- 1	and	-	\vdash	Field	d Test
Depth (ft.)	Recovery %	Blow Counts	Sample	Well Diagram	PID	USCS	to a real cold by discussion when we			YMBOL, maximum part		9	QJ	E		>	SS	~
12000	September 1		Depth (ft.)			Symbol	size*, struct	ure, odor,		descriptions, geologic	% Coarse	% Fine	% Coarse	% Mediur	% Hine	% Fines	Toughnes	Plasticity
									interpretation)		×	38	%	×	*	2 2	To	P
0 -	1						4" Asphalt					ш			Т	1	1	
			1.0	11818118			4 Aspnait					П			П	1		11
							Hand auger fire	t 5 feet				П			П	1	1	
							0					П		- 1	П	1	1	
												П			П	1	1	
												П		- 1	П	1	1	
												П			П	1	1	
												П			П	1	1	
	2000					170700	- CANDADANA AND AN AL MARKATA		W			П		٠.			1	
- 5 -	95%	10/10/2010	5'		0.2	ML	Brown sandy s	it, dry, r	o odor			П		5	25 7	70	1	
												П			П	1	1	
												П			П	1	1	
												П			П	1		
												П			П	1	1	
												П		- 1	П	1	1	
												П		- 1	П	1	1	
												ш		- 1	П	1	1	
_ 10 _	90%	18/13/20	10'-11.5'		0.3		Light brown sa	ndy silt	moist, no odor			2	3	5	20 7	70	1	
20	3078	10,10,10	10 11.5		0.0		Light Brown 3d	indy sinc,	moist, no odor			_	3	۲ I			1	
												П		- 1	Т	1	1	
												П		- 1	П	1	1	
												П			П	1	1	
						SP-SM	13'-14' well gra	ided san	d with silt and g	ravels	2	13	20	35 2	0 1	.0	Т	\Box
											-4-	$\downarrow \downarrow$		-4	-4-	4	4	₩
	ST AND THE ST		111.794															
15	80%	23/31/31	15'-16.5'		0.6	ML	Light gray sand	y silt, m	oist, no odor, ru	sty orange mottling	Ç.			3	35 6	55		
							110 721 42 325											
																1		
		1																
		1																
						 	 				-4-	+		-+	-+	-	╀	₩
no.	CEN	notestes	201 24 51		0.5	C1.1	track and the	L	NESTRA DES SERVICES	13020				5		10		
20 -	65%	20/44/48	20'-21.5'		0.5	SM	Light grayish w	nite silty	sand, dry, no o	аог					30 2	2U		Ш
											C	_	_	_	FF	S	T	Р
		Water Le	- I D				Sample ID		Well Diagram			e	mma	_				

L - Low M - Medium H - High Dry Strength: N - None L - Low M - Meduim H - High V - Very High NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size. NOTE: Soil identifications based on ASTM Method D2248 "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)"

Screen

Filter Sand

Cuttings

Cuncrete

Bentonite Seal

Grout

0,3

3888

777

Boring Depth (Linear ft.)

Sample Method

BORING NO.

N - Nonplastic L - Low M - Medium H - High

Number of Samples

130

Cal Mod Split Spoon

MW-708

Cont. Core

Geoprobe

Thin Wall Tube

Undisturbed Sample

Split Spoon Sample

Plasticity:

CC

T

G

Stabilized

Water

R - Rapid S - Slow N - None

Elapsed Time

(hr.)

Dilatancy:

Toughness:

First Water

Date

Field Tests



BORING NO.

MW-708

Section Part									Visual-Manual Identification & Description	Gra	avel		Sand	ı		F	ield 1	est	┪
2 3 05 30 10 100% 23/24/42 25-26-5 36-7 3M Olive gray silty sand, moist, slight odor, trace coarse and medium sand 2 3 05 30 10 10 100 100 100 100 100 100 100 10	Depth (ft.)		Blow Counts		Well Dia	agram	PID		(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
### Med Tests Distancy R - Rapid S - Story Refer Tests Distancy R - Rapid S - Story Refer Tests Distancy R - Rapid S - Story Refer Tests Distancy R - Rapid S - Story Refer Tests Distancy R - Rapid S - Story Refer Tests Distancy R - Rapid S - Story Refer Tests Distancy R - Rapid S - Story Refer Tests Distancy R - Rapid S - Story Refer Tests Distancy R - Rapid S - Story Refer Tests Distancy R - Rapid S - Story Refer Tests Distancy R - Rapid S - Story Refer Tests Distancy R - Rapid S - Story Refer Tests Distancy R - Rapid S - Story Refer Tests Distancy R - Rapid S - Story Refer Tests Distancy R - Rapid S - Story Refer Tests Distancy R - Rapid S - Story Refer Tests Refe	_ 20 _	65%	20/44/48	20'-21 5			0.5	SM	Light grayish white silty sand, dry, no odor					80	20				
## 35 - 80% 22/31/30 35'-36.5' 16.8 SP-SM Olive gray poorly graded sand with silt, moist, slight odor 40 - 60% 33/50- 40'-41.5' 0.9 SP-SM Greenish gray poorly graded sand with silt, moist, slight odor, 2 3 5 80 10 45 - 65% 20/50- 45'-46.5' 8.7 SP Light gray poorly graded sand, moist, slight odor 5 70 20 5 Field Tests Dilatancy: R-Rapid 5-Slow N-None Plasticity: N-Noneplastic L-Low M-Medium H-High U-Very Hight U	— 25 —	100%	15/24/42	25'-26.5'			16.7	SM				2	თ	65	30				
- 40 - 60% 33/50+ 40'-41.5' 0.9 SP-SM Greenish gray poorly graded sand with silt, moist, slight odor, trace coarse sand and fine subrounded gravel 2 3 5 80 10 2 3 5 80 10 4 5 46.5' 8.7 SP Light gray poorly graded sand, moist, slight odor 5 70% 33/50+ 50'-51.5' 27.4 SM Yellowish brown silty sand, moist, slight odor 8.5 15 15 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	– 30 –	85%	16/27/40	30'-31.5'			8.6	SM	Gray silty sand, moist, slight odor, trace medium sand				3	77	20				
- 45 - 65% 20/50+ 45'-46.5' 8.7 SP Light gray poorly graded sand, moist, slight odor 5 70 20 5 5 70 20 5 5 70 20 5 5 70 20 5 7	– 35 –	80%	22/31/50	35'-36.5'			16.8	SP-SM	Olive gray poorly graded sand with silt, moist, slight odor					90	10				
Tield Tests Dilatancy: Toughness: R - Rapid S - Slow M - Medium H - High Dry Strength: N - None L - Low M - Medium H - High Dry Strength: N - None L - Low M - Medium H - High	– 40 –	60%	33/50+	40'-41.5'			0.9	SP-SM			2	3	5	80	10				
Field Tests Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High Toughness: L - Low M - Medium H - High Dry Strength: N - None L - Low M - Medium H - High V - Very High	– 45 –	65%	20/50+	45'-46.5'			8.7	SP	Light gray poorly graded sand, moist, slight odor			5	70	20	5				
Field Tests Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High Toughness: L - Low M - Medium H - High Dry Strength: N - None L - Low M - Meduim H - High V - Very High	– 50 –	70%	33/50+	50'-51.5'			27.4	SM	Yellowish brown silty sand, moist, slight odor										
	Fiel	d Tests						<u> </u>			F	L	IVI	r	1-5	υ	ı	r	4
			Toughness:	L - Low				ot t t :		gh								_	4

NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

NOTE: Soil identifications based on ASTM Method D2248 "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)"



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Depth (ft.) Recovery (%) Blow Counts Per life (ft.) Depth (ft.) Per life (ft.) Depth (ft.) Per life (ft.) Depth (ft.) Per life	oarse		•	•				Sample		Pocovory	
	%	C	descriptions, geologic	, , , , , , , , , , , , , , , , , , , ,	PID (PPM)	ell Diagram	V		Blow Counts		Depth (ft.)
- 50 - 70% 33/50+ 50'-51.5' 27.4 SM Yellowish brown silty sand, moist, slight odor 85 15			odor	Yellowish brown silty sand, moist, slight odor	27.4			50'-51.5'	33/50+	70%	50
- 55 - 75% 17/30/50 55'-56.5'			moist, no odor	M Olive gray poorly graded sand with silt, moist, no odor	5.8			55'-56.5'	17/30/50	75%	- 55 -
- 60 - 55% 50+ 60'-61.5' 2.7 SP Olive gray poorly graded sand				Olive gray poorly graded sand	2.7			60'-61.5'	50+	55%	- 60 -
- 65 - 60% 50+ 65'-66.5' 2.5 SP-SM Very light gray poorly graded sand with silt, moist, no odor 5 15 40 30 10		or	silt, moist, no odor	M Very light gray poorly graded sand with silt, moist, no odor	2.5			65'-66.5'	50+	60%	- 65 -
- 70 - 65% 29/50+ 70'-71.5' 3.0 SP-SM Light gray poorly graded sand with silt, moist, slight odor 90 10			moist, slight odor	M Light gray poorly graded sand with silt, moist, slight odor	3.0			70'-71.5'	29/50+	65%	- 70 -
- 75 - 50% 50+ 75'-76 5' 56.4 SP-SM Gray poorly graded sand with silt, moist, hydrocarbon odor 10 10 45 25 10		lor	., hydrocarbon odor	M Gray poorly graded sand with silt, moist, hydrocarbon odo	56.4			75'-76 5'	50+	50%	- 75 -
SP-SM Olive gray poorly graded sand with silt, moist, hydrocarbon odor	С	on	moist, hydrocarbon	M I	38.2		-	80'-81 5'	50+	40%	- 80 -
Field Tests Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High	ligh	/erv Hi								d Tests	Fiel
Toughness: L - Low M - Medium H - High Dry Strength: N - None L - Low M - Medium H - High V - Very High NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.	ıığı	reiy fil					v 1'	L - LOW	rougilless:		
NOTE: Soil identifications based on ASTM Method D2248 "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)"	ocedure	ual Proc	n of Soils (Visual-Manual P	248 "Standard Practice for Description and Identification of Soils (Visual-Manual	n ASTM Metho	ions based	fica	E: Soil identifi	NOT		



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Depth Proceeding Depth Depth								Visual-Manual Identification & Description	Gra	avel		San	d	T	Ţ	Fi	ield T	est	4
### ### ### ### ### ### ### ### ### ##	Depth (ft.)		Blow Counts		Well Diagram	PID		size*, structure, odor, moisture, optional descriptions, geologic	% Coarse	% Fine	% Coarse	% Medium	% Fine	70 FINS	% Fines	Dilatancy	Toughness	Plasticity	Strength
- 90 - 50% 50° 90°91.5° 133 SP-SM SAA 50° 50° 90°91.5° 2255 SP-SM Dark Gray poorly graded sand with silt, moist, strong 3 12 45 30 10 Pydrocarbon odor 2 3 10 50 30 5 Pydrocarbon odor 3 2 3 10 10 25 50 Pydrocarbon odor 3 2 3 10 10 25 50 Pydrocarbon odor 3 2 3 10 10 25 50 Pydrocarbon odor 3 2 3 10 10 25 50 Pydrocarbon odor 3 2 3 10 10 25 50 Pydrocarbon odor 3 2 3 3 10 10 25 50 Pydrocarbon odor, trace fine gravels	— 80 —	40%	50+	80'-81.5'		38.2	SP-SM	Olive gray, moist, hydrocarbon odor					91	0 1	.0				
### Dilatancy: ### Reput S-Signature Particle Size is determined by declaration with silt, wet, strong hydrocarbon odor 100 - 25%	– 85 –	45%	50+	85'-86.5'		83.9	SP-SM	Olive gray poorly graded sand with silt, moist, strong odor		10	10) 45	5 2	5 1	.0				
First water at ~105 - 100 - 25% 50+ 100'-101.5' 2375 SP Dark gray poorly graded sand 3 2 10 50 30 5	— 90 —	50%	50+	90'-91.5'		133	SP-SM	SAA		5	15	3 40) 3(0 1	.0				
First water at ~105 40% 30/50+ 105'-106.5' 2325 ML/SM Dark gray sandy silt/silty sand, wet, strong hydrocarbon odor 2 3 10 10 25 50 Dark gray poorly graded sand with silt, wet, strong hydrocarbon odor, trace fine gravels Field Tests Dilatancy: R-Rapid S-Slow N-None Plasticity: N-Nonplastic L-Low M-Medium H-High Dry Strength: N-None L-Low M-Medium H-High V-Very High-NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.	— 95 —	10%	50+	95'-96.5'		2255	SP-SM			3	12	2 45	5 3	0 1	.0				
- 105 - 40% 30/50+ 105'-106.5' 2325 ML/SM Dark gray sandy silt/silty sand, wet, strong hydrocarbon odor 2 3 10 10 25 50	– 100 –	25%	50+	100'-101.5'		2375	SP	Dark gray poorly graded sand	3	2	10) 50) 3	0 5	5				
Field Tests Dilatancy: Toughness: Dilatancy: Toughness: NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.	— 105 —	40%	30/50+	105'-106.5'		2325			2	3	10) 1() 2.	5 5	50				
Field Tests Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High Toughness: L - Low M - Medium H - High Dry Strength: N - None L - Low M - Medium H - High V - Very High NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.	— 110 —	60%	50+	110'-111.5'		2309	SP-SM												
Toughness: L - Low M - Medium H - High Dry Strength: N - None L - Low M - Meduim H - High V - Very High NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.	Field	d Tests	Dilatancy:	R - Rap	id S - Slow N	N - None		Plasticity: N - Nonplastic L - Low M - Medium H - High	Ċ	F	C	M	<u></u> F	<u> </u>	3	U	1	۲	٥
					M - Medium	H - High		Dry Strength: N - None L - Low M - Meduim H - High V - Very Hi	gh										_
				r. c-1111							_		_		_			_	4



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							Visual-Manual Identification & Description	Gra	avel		Sand	ı		F	ield	Test	
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic	% Coarse	Je	% Coarse	% Medium	e.	ıes	Dilatancy	Toughness	Plasticity	ngth
							interpretation)	o) %	% Fine	°C %	W %	% Fine	% Fines	Dilat	Toug	Plast	Stre
— 110 —	60%	50+	110'-111.5'		2309	SP-SM	Dark gray poorly graded sand with silt, wet, strong		2	8	50	30	10				
							hydrocarbon odor, trace fine gravels										
— 115 —	85%	17/20/24	115'-116.5'		177	SP-SM	Dark gray poorly graded sand with silt, wet, hydrocarbon odor				5	85	10				
— 120 —	95%	20/50+	120'-121.5'		1769	SP-SM	Dark gray poorly graded sand with silt, wet, hydrocarbon odor		3	7	50	30	10				
— 125 —	90%	17/50+	125'-126.5'		1184	SP	Dark gray poorly graded sand, w/trace coarse and fine gravels	2	3	5	50	35	5				
— 130 —	95%	8/10/30	130'-131.5'		2207	SP	SAA, w/trace fine gravels		2	8	55	30	5				
– 135 –																	
— 140 —																	
F1.1	d Tosts	Dileter		: 4 C C! -	l Ne		Disability N. Norgelestie I. Levy M. S. P	С	F	С	М	F	FS	D	Τ	Р	S
Field	d Tests	Dilatancy: Toughness:		id S - Slow N M - Medium			Plasticity: N - Nonplastic L - Low M - Medium H - High Dry Strength: N - None L - Low M - Meduim H - High V - Very Hi	gh									
						Size is de	termined by direct observation within the limitations of sampler size.	_		_						_	J
	•	NOT	E: Soil identif	cations based	on ASTM Met	hod D2248	"Standard Practice for Description and Identification of Soils (Visual-Manual Pro	cedu	re)"								
																	_

envi	MUF	REX tal, inc				В	ORING LO	OG								BOR MV				
- Water		SHARK BYSTERS								MELEUENO		40		Pag		1	l	of		5
PROJECT LOCATION		Well Installation 12345 Lakelan		Ee Springs CA						MEI FILE NO. PROJECT MGR.		_	03-00 emy				—	—	—	_
CLIENT		Lakeland Deve								FIELD REP.		-	ne S	_			—	—	—	_
CONTRACT	OR	WDC, Montcla		p.						DATE STARTED			4/20		_		_	_	_	_
DRILLER	Villa.		William Tanamatan	s: Ricardo, Bobby						DATE FINISHED		1000	25/20	_					_	_
Elevation	140.48		Datum		Boring L	ocation	Hospital near	MANN COM	0	THE STATE OF THE S				-	<u> </u>	_	—	=	=	=
Item	140.40	Casing	Samp	ler Core Barrel		e & Model	CONTRACTOR OF CONTRACTOR	TAILE STATE OF	E 95	Hammer Type	Di	illing	Mud	1	$\overline{}$	To	otal	Dept	h	_
Туре		CFA	S	NA	₹ Truc			7	Cat-Head	Safety	П	_	ntoni		H		100		_	_
Inside Diame	ter (in.)	5-3/4"	2"	NA.	☐ ATV				Winch	Doughnut	ΙĦ	Pol	ymer	100			13	0'		
Hammer Wei	The state of the s	NA	140		Trac				Roller Bit	✓ Automatic	4	No								
Hammer Fall	(in.)	NA	30		Skid		Hand Auger	J	Cutting Head	Drilling Notes: Sa	mples fo		al-ma			nly				_
Depth (ft.)	Recovery %	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	(density/consiste	ncy, colo		Description SYMBOL, maximum par descriptions, geologic	ticle	e E K	% Coarse	Sand Wedium		% Fines	Dilatancy	Toughness le	Plasticity	Γ
- 0 -	95%	9/14/2016	5'		1.2	ML	4" Asphalt Hand auger firs 5YR 4/4 Reddis		t n sandy silt, moi:	st, no odor				5	20	75				
_ 10 _	100%	11/12/13	10'-11.5'		2.1	SM	10YR 5/6 Yellor moist, no odor		own silty sand w	ith brown mottling,					85	15				
– 15 –	100%	13/27/38	15'-16.5'		1.3	SP-SM			h gray poorly gra tling, moist, no o	ded sand with silt v dor	with				90	10				
_ 20 _	80%	20/50+	20'-21.5'		<1 <mark>.0</mark>	SP-SM	10YR 7/1 Light	gray po	oorly graded sand	d with silt, moist, no)			30	60	10				-

Field Tests Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High
Toughness: L - Low M - Medium H - High Dry Strength: N - None L - Low M - Medium H - High V - Very High
NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

CC

G

Water Level Data

Elapsed Time

(hr.)

Time

Date

Depth in feet to:

First Water

Stabilized

Water

NOTE: Soil identifications based on ASTM Method D2248 "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)"

Sample ID

Cont. Core

Geoprobe

Thin Wall Tube

Undisturbed Sample

Split Spoon Sample

Well Diagram

Filter Sand

Cuttings

Cuncrete

Bentonite Seal

Grout

Riser Pipe

Screen

0,3

3888

111

Summary

130'

Cal Mod Split Spoon

MW-709

Boring Depth (Linear ft.)

Sample Method

BORING NO.

Number of Samples



BORING NO.

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							Visual-Manual Identification & Description	Gra	ivel		Sand			Fi	eld T	est
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity
- 20 -	80%	20/50+	20'-21 5		<1.0	SP-SM	10YR 7/1 Light gray, moist, no odor				30	60	10			
– 25 –	75%	25/50+	25'-26.5'		<1.0	SP-SM	SAA			5	45	40	10			
– 30 –	0%	35/50+	30'-31.5'		NA		No Recovery									
- 35 -	80%	15/50+	35'-36.5'		<1.0	SP-SM	10YR 6/2 Light brownish gray poorly graded sand with siltwith trace fine gravels, moist, no odor		3	7	35	45	10			
– 40 –	90%	20/30/38	40'-41.5'		<1.0	SP-SM	5Y 7/2 Light gray poorly graded sand with silt, moist, no odor		10	15	35	30	10			
– 45 –	85%	18/26/30	45'-46.5'		<1.0	SW	5Y 7/1 Light gray well graded sand with gravels, moist, no odor	5	10	20	30	30	5			
– 50 –	70%	28/50+	50'-51.5'		1.5	SP-SM	5Y 7/4 Pale yellow poorly graded sand with silt with brown mottling, moist, no odor		5	10	45	30	10			
F1.11	l Tosts	Dilet		:4 6 61	N N		Disability N. Norreleatie I. Levy A. S. P	С	F	С	М	F	FS	D	Т	Р
rield	d Tests	Dilatancy: Toughness:		id S - Slow I M - Medium			Plasticity: N - Nonplastic L - Low M - Medium H - High Dry Strength: N - None L - Low M - Medium H - High V - Very Hi									



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								Visual-Manual Identification & Description	Gra	avel		Sano	ı			ield	Test
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well	Diagram	PID (PPM)	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity
- 50 -	70%	28/50+	50'-51.5'			1.5	SP-SM	5Y 7/4 Pale yellow poorly graded sand with silt with brown mottling, moist, no odor		5	10	45	30	10			
– 55 –	70%	25/50+	55'-56.5'			7.5	l VD	10YR 6/6 Brownish yellow poorly graded sand with trace fine gravel, moist, no odor		3	7	25	60	5			
– 60 –	85%	50+	60'-61 5'			13.3		2.5Y 7/3 Pale yellow poorly graded sand with silt, moist, slight odor			5	25	60	10			
– 65 –	- 75%	50÷	65'-66.5'			19.9	SP-SM	2.5Y 6/4 Light yellowish brown poorly graded sand with silt, moist, slight odor			5	40	45	10			
– 70 –	100%	25/30/42	70'-71.5'			21.3	SM	Gley1 5/5G Dark greenish gray silty sand, moist, slight odor			3	7	75	15			
– 75 –	95%	23/30/50+	75'-76.5'			27.3	SP-SM	Gley1 4/10GY Dark greenish gray poorly graded sand with silt, moist, slight odor				5	85	10			
– 80 –	- 15%	50+	80'-81.5'			7.1	SP-SM	Gley1 6/10BG Greenish gray poorly graded sand with silt, moist, slight odor	С	F		35 M		10	D	Т	plo
Fiel	d Tests	Dilatancy:				N - None	<u> </u>	Plasticity: N - Nonplastic L - Low M - Medium H - High		<u> </u>	٠	191	1 "	13	U	.	, 13
		Toughness:	L - Low			H - High imum Particle	Size is det	Dry Strength: N - None L - Low M - Meduim H - High V - Very Hermined by direct observation within the limitations of sampler size.	ign								—
		NOT	E: Soil identifi					"Standard Practice for Description and Identification of Soils (Visual-Manual Pro	cedu	re)"							



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Visual-Manual Identification & Description Gravel Sand			Fie	eld Tes	it
Depth (ft.) Recovery Blow Counts Blow Coun	% Fine	% Fines	Dilatancy	Plasticity	Strength
- 80 - 15% 50+ 80'-81.5' 7.1 SP-SM Gley1 6/10BG Greenish gray, moist, slight odor 10 35	45 1	10			
SP Gley1 4/5B Dark bluish gray poorly graded sand, moist, slight odor	85 5	5			
SP Gley 7/5B Light bluish gray poorly graded sand, moist, slight odor	50 5	5			
4.3 SP Gley 6/10Y Greenish gray poorly graded sand, moist, slight odor	60 5	5			
- 100 - 80% 50+ 100'-101.5' 3.1 SP Gley 5/5G Greenish gray poorly graded sand, moist, slight odor 5 10 15 25	40 5	5			
- 105 - 90% 15/31/50 105'-106.5' 4.3 SP Dark greenish gray poorly graded sand, moist, slight odor	90 1	10			
Gley 4/10BG Dark greenish gray poorly graded sand, moist, mild odor	85 5 F F		D 1	ГР	S
Field Tests Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High Toughness: L - Low M - Medium H - High Dry Strength: N - None L - Low M - Medium H - High V - Very High					コ
NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.					一
NOTE: Soil identifications based on ASTM Method D2248 "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)"				_	



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							Visual-Manual Identification & Description	Gra	avel		Sand	ı		F	ield 1	Гest
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity
— 110 —	45%	50+	110'-111.5'		60.5	SP	Gley 4/10BG Dark greenish gray poorly graded sand, moist, mild odor					85	10			
							illina odol									
																_
							Gley 5/5BG Greenish gray sandy silt, wet, moderate to strong									
— 115 —	100%	15/30/50+	115'-116.5'		104	ML	odor				5	20	75			
— 120 —	95%	13/32/50	120'-121.5'		67.2	SP-SM	Gley 4/5BG Dark greenish gray poorly graded sand with silt, wet, moderate odor					90	10			
							wee, moderate oder									
							Gley 4/10GY Dark greenish gray poorly graded sand, wet,									
— 125 —	70%	17/50+	125'-126.5'		42.2	SP	moderate odor			10	60	25	5			
— 130 —	80%	12/23/37	130'-131.5'		17.1	SP-SM	Gley 4/5B Dark bluish gray poorly graded sand with silt, wet, slight odor			10	50	30	10			
125																
— 135 —																
— 140 —																
								С	F	С	М	F	FS	D	Т	P :
Field	d Tests	Dilatancy: Toughness:		id S - Slow I M - Medium			Plasticity: N - Nonplastic L - Low M - Medium H - High Dry Strength: N - None L - Low M - Meduim H - High V - Very Hi									
				*NOTE: Max	imum Particle		termined by direct observation within the limitations of sampler size.							_		_
		NOT	E: Soil identifi	cations based	on ASTM Met	hod D2248	"Standard Practice for Description and Identification of Soils (Visual-Manual Pro	cedu	re)"						_	

MU	REX ental, inc				В	ORING LO	G								r	νıν	V-7	NO 71(0
-Maria has been market or	CENTANC INDUCTION								AACI E	I F NO		-	200.0	Pag		1	i	of	5
PROJECT LOCATION	Well Installat		Fe Springs, CA							LE NO. CT MGR.		_		001-2		_	—	—	—
CLIENT		The second second	7. 4. 4. 4. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.						FIELD			100		y Squ			—	—	
CONTRACTOR	WDC, Monto	elopment Cor	μ.							STARTED			/12/2	Sosic	—	_	_		_
DRILLER			s: Ricardo, Bobby							FINISHED		-	/13/2	_	—		_	—	
STATE OF THE STATE			s. Kicardo, Dobby						DAIL	HIVISHED		1,	13/2	OII	<u> </u>		=	_	_
TATALAN CONTRACTOR TO THE PERSON OF T	2.15 ft.	Datum			ocation	Hospital near N			_		_				—				
ltem	Casing	Samp			e & Model		CME		_	nmer Type			g Mu		╄	T	otal i	Depth	n:
Type	CFA	S	NA	✓ Tru	ck		√	Cat-Head		Safety	Ι₽		enton		ı		12	יחי	
Inside Diameter (in.) Hammer Weight (lb.)	5-3/4" NA	2" 140	NA.	☐ ATV			⊢=	Winch Roller Bit	-	Doughnut Automatic	一日		olyme one				13	U	
Hammer Fall (in.)	NA NA	30		☐ Trac				Cutting Head	Drilling	50 S C - 100 C - 110	amples f	- 10	12.10	anua	LID	nlu	_	—	
riammer Fall (m.)	NA	30		SKIL							ampies i	Grave		Sano		үшү		Field	Test
Depth (ft.) Recovery	% Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	(density/consisten	cy, color,	al Identification & GROUP NAME & S moisture, optional interpretation)	YMBOL, m	naximum pa		% Coarse	93	E	Г	% Fines	Dilatancy	42	Plasticity
- 0 - 30%	50+	5'		0.0	ML	4" Asphalt Hand auger first Dark brown san		dry, no odor						5	25	70			
_ 10 _ 80%	11/27/39	10'-11.5'		0.0	ML	Brown sandy sil	t, moist	, no odor						5	15	80			
– 15 – 95%	30/40/50	15'-16.5'		0.0	SP-SM	Light gray poorl	<mark>/</mark> grade	d sand with silt,	moist, n	o odor			3	7	80	10			
– 20 – 95%	27/29/40	20'-21.5'		0.0	ML	Greenish gray sa	andy sili	t, <mark>moist, n</mark> o odoi				С	- C	M		80 FS	D		Р

Depth in feet to: Riser Pipe **Elapsed Time** CC Cont. Core Screen Boring Depth (Linear ft.) 130' Date Time Stabilized 0, (hr.) First Water Thin Wall Tube Filter Sand Sample Method Cal Mod Split Spoon Water Cuttings Undisturbed Sample Number of Samples Split Spoon Sample Grout 3888 BORING NO. G Geoprobe Cuncrete MW-710 111 Bentonite Seal **Field Tests** Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High

Dry Strength: NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

N - None L - Low M - Meduim H - High V - Very High

NOTE: Soil identifications based on ASTM Method D2248 "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)"

Toughness:

L - Low M - Medium H - High



BORING NO.
MW-710

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							Visual-Manual Identification & Description	Gra	ivel		Sand	1		F	ield	rest
Pepth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well Diagram	n PID	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity
20 —	95%	27/29/40	20'-21 5		0.0	ML	Greenish gray sandy silt, moist, no odor					20	80			
2 5 —	90%	20/30/38	25'-26.5'		0.0	SM	Light brown silty sand with brown mottling, moist, no odor				5	75	20			
30 —	80%	13/18/33	30'-31.5'		0.0	SP-SM	Yellowish gray poorly graded sand with silt, moist, no odor				3	87	10			
35 -	65%	21/32/50	35'-36.5'		0.0	SP	Light gray poorly graded sand, moist, no odor			3	7	85	5			
40 —	50%	22/29/40	40'-41.5'		0.0	SP	SAA				5	80	5			
45 🖚	45%	28/35/43	45'-46.5'		0.0	SP	Very light gray poorly graded sand, moist, no odor			5	20	70	5			
50 —	55%	23/38/50	50'-51.5'		0.0		Two 1-inch bands of rust color staining normal to core apx 3 inch apart at 49' bgs Light gray well graded sand with silt, moist, no odor			20 C	40 M	30	10 FS	D		



BORING NO.

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Sample S
- 55 - 70% 18/27/43 55'-56.5' 0.0 SW Brownish gray well graded sand, moist, no odor 5 30 40 20 5 - 60 - 90% 28/42/50 60'-61.5' 0.0 SP Light yellowish gray poorly graded sand, moist, no odor 5 20 70 5 - 65 - 80% 18/50+ 65'-66.5' 0.0 SP-SM Light gray poorly graded sand with silt, moist, no odor 15 75 10
- 60 - 90% 28/42/50 60'-61.5' 0.0 SP Light yellowish gray poorly graded sand, moist, no odor 5 20 70 5 0.0 SP-SM Light gray poorly graded sand with silt, moist, no odor 15 75 10 0.0 SP-SM Light gray poorly graded sand with silt, moist, no odor 15 75 10 0.0 SP-SM Light gray poorly graded sand with silt, moist, no odor 15 75 10 0.0 SP-SM Light gray poorly graded sand with silt, moist, no odor 15 75 10 0.0 SP-SM Light gray poorly graded sand with silt, moist, no odor 15 75 10 0.0 SP-SM Light gray poorly graded sand with silt, moist, no odor 15 75 10 0.0 SP-SM Light gray poorly graded sand with silt, moist, no odor 15 75 10 0.0 SP-SM Light gray poorly graded sand with silt, moist, no odor 15 75 10 0.0 SP-SM Light gray poorly graded sand with silt, moist, no odor 15 75 10 0.0 SP-SM Light gray poorly graded sand with silt, moist, no odor 15 75 10 0.0 SP-SM Light gray poorly graded sand with silt, moist, no odor 15 75 10 0.0 SP-SM Light gray poorly graded sand with silt, moist, no odor 15 75 10 0.0 SP-SM Light gray poorly graded sand with silt, moist, no odor 15 75 10 0.0 SP-SM Light gray poorly graded sand with silt, moist, no odor 15 75 10 0.0 SP-SM Light gray poorly graded sand with silt, moist, no odor 15 75 10 0.0 SP-SM Light gray poorly graded sand with silt, moist, no odor 15 75 10 0.0 SP-SM Light gray poorly graded sand with silt, moist, no odor 15 75 10 0.0 SP-SM Light gray poorly graded sand with silt, moist, no odor 15 75 10 0.0 SP-SM Light gray poorly graded sand with silt, moist, no odor 15 75 10 0.0 SP-SM Light gray poorly graded sand with silt, moist, no odor 15 75 10 0.0 SP-SM Light gray poorly graded sand with silt, moist, no odor 15 75 10 0.0 SP-SM Light gray poorly graded sand with silt, moist, no odor 15 75 10 0.0 SP-SM Light gray poorly graded sand with silt, moist, no odor 15 75 10 0.0 SP-SM Light gray poorly graded sand with silt, moist, no odor 15 75 10 0.0 SP-SM Light gray poorly graded sand with silt, moist, no odor 15 75 10 0.0 SP-SM Light gray poorly graded sand with silt, moist, no odor 15
- 65 - 80% 18/50+ 65'-66 5' 0.0 SP-SM Light gray poorly graded sand with silt, moist, no odor 15 75 10
- 70 - 100% 32/50+ 70'-715' 0.0 ML Dark gray silt with sand, moist, no odor 15 85
- 75 - 85% 12/39/50+ 75'-76.5' 0.0 SP-SM Light gray poorly graded sand with silt, moist, no odor 5 85 10
- 80 - 80% 26/50+ 80'-81.5' - 0.0 SP Light yellowish brown poorly graded sand, moist, no odor 5 10 60 20 5 C F C M F FS D T P S
Field Tests Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High
Field Tests Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High Toughness: L - Low M - Medium H - High Dry Strength: N - None L - Low M - Medium H - High V - Very High NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.



BORING NO.

MW-710

							Visual-Manual Identification & Description	Gra	ravel	lacksquare	Sano	三			Field	Test	4
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
— 80 —	80%	26/50+	80'-81.5'		0.0	SP	Light yellowish brown poorly graded sand, moist, no odor		5	10	60	20	5				
– 85 –	60%	28/50+	85'-86.5'		0.0	SP-SM	Light yellowish brown poorly graded sand with silt, moist, no odor				60	30	10				
– 90 –	45%	50+	90'-91.5'		0.0	SP-SM	Greenish gray poorly graded sand with silt, moist, no odor			10	60	20	10				
— 95 —	15%	50+	95'-96.5'		0.0	SP-SM	Light gray poorly graded sand with silt, moist, no odor			2	68	20	10				
— 100 —	95%	35/50+	100'-101.5'		1.2	ML	Olive brown sandy silt, moist, no odor					20	80				
— 105 —	90%	15/50+	105'-106.5'		1.1	SM/ML	Greenish brown sandy silt/silty sand, wet, no odot			10	5	35	50				
— 110 —	95%	20/23/27	110'-111.5'		2.4	SP	Gray poorly graded sand, wet, no odor	С	F	С		70		D	Т	P	S
Field	d Tests	Dilatancy:		id S-Slow N		<u> </u>	Plasticity: N - Nonplastic L - Low M - Medium H - High		<u> </u>	<u> </u>	1	<u> </u>				<u> </u>	٦
<u> </u>		Toughness:	L - Low	M - Medium		Ci=a !1	Dry Strength: N - None L - Low M - Meduim H - High V - Very H	gh		_		_					4
		NOTE	: Soil identifi				ermined by direct observation within the limitations of sampler size. "Standard Practice for Description and Identification of Soils (Visual-Manual Pro	cedii	ıre\"								\dashv
		NOTE		wateris pascu (THE INTERIOR		Standard of Sound International Control of Sound (Visual-Ividitual F10	Juu	,								



BORING NO.

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Depth (ft.)	Recovery (%)	Blow Counts 20/23/27	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	Visual-Manual Identification & Description (density/consistency, color, GROUP NAME & SYMBOL, maximum particle	se		se	inm			ج	ess	£	
- 110 -	90%	20/23/27				Symbol	size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
			110'-111.5'		2.4	SP	Gray poorly graded sand, wet, no odor				25	70	5				
– 115 –	85%	21/50+	115'-116.5'		2	SM	Olive gray silty sand, wet, no odor				15	70	15				
- 120 -	100%	25/50+	120'-121.5'		2.7	ML	Olive gray silt with sand, wet, no odor					25	75				
– 125 –	90%	6/12/30	125'-126.5'		2.2	SP	Gray poorly graded sand with gravels, wet, no odor	10	10	25	40	10	5				
– 130 –	65%	8/10/50	130'-131.5'		1.9	SP	Light gray poorly graded sand with gravels, wet, no odor	10	10	15	50	10	5				
– 135 –																	
– 140 –																	
Field ⁻		Dilatancy:		id S - Slow 1			Plasticity: N - Nonplastic L - Low M - Medium H - High	С	F	С	М	F	FS	D	T	Р	S

envi	MUF	REX ital, inc				В	ORING L	OG							N	BORI VIV	V-7	711	1
PROJECT		Well Installation	20							MEI FILE NO.		10/	03-00	Pag		1		of	5
LOCATION		12345 Lakelan		Fe Springs CA						PROJECT MGR.			emy			_	_	—	
CLIENT		Lakeland Deve								FIELD REP.			ine So	_	ic		—		
CONTRAC	TOR	WDC, Montcla		μ.						DATE STARTED			14/20		_		_	_	
DRILLER				s: Ricardo, Bobby	2					DATE FINISHED		2000	17/20	_					
State of Land	70000			3. Micardo, Bobby			107 700 97 500			DATE THISTIED		-/-	.,, 20		_	_	_	_	_
Elevation	128.0		Datum		Boring Lo		Hospital ~500					****		_	_	-			
ltem Tumo		Casing CFA	Samp	ler Core Barrel		& Model			Cat-Head	Hammer Type	_		Mud		⊢	10)tai L	Depth	1
Type Inside Diam	eter (in)	5-3/4"	2"	NA.	✓ Truc			V	Winch	Safety Doughnut	l H		ntonit ymer	1.00			13	2"	
Hammer We		NA	140	1 1,000	Trac			片片	Roller Bit	✓ Automatic	7	Nor	Equipment .				13	_	
Hammer Fal	(in.)	NA	30		Skid			l H	Cutting Head	000000000000000000000000000000000000000	nples for	100000	100	nual	IDo	nly	_	_	
			7,000						ual Identification &			ravel		Sand			J	Field 1	Test
Depth (ft.)	Recovery %	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	(density/consiste	ncy, colo	r, GROUP NAME & S	SYMBOL, maximum par descriptions, geologic		% Tine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity
_ 5 _	100% 55%	15/18/21 20/50+	5' 10'-11.5'		0.0	ML.		t with s	and, moist, no oc	dor orange mottling, mo	oist,		3	7		80			
— 15 —	100%	18/23/26	15'-16.5'		0.0	SM	Yellowish brov	vn silty s	sand, moist, no o	dor	3	3			54	40			
_ 20 _	95%	16/25/29	20'-21.5'		0.0	ML	Grayish brown	sandy s	silt, moist, no odd	or			5	5	20	70			

C F C M F FS D T P Sample ID Water Level Data Well Diagram Summary Depth in feet to: Riser Pipe **Elapsed Time** CC Cont. Core Screen Boring Depth (Linear ft.) 132' Date Time Stabilized 0, 1 (hr.) First Water Thin Wall Tube Filter Sand Sample Method Cal Mod Split Spoon Water Undisturbed Sample Cuttings Number of Samples Split Spoon Sample Grout 3888 Cuncrete BORING NO. G Geoprobe MW-711 111 Bentonite Seal Field Tests Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High

L - Low M - Medium H - High Dry Strength: N - None L - Low M - Medium H - High V - Very High NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

NOTE: Soil identifications based on ASTM Method D2248 "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)"

Toughness:



BORING NO. MW-711

								Visual-Manual Identification & Description	Gra	avel		Sand			F	ield	Гest	
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well Diag	gram	PID	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
_ 20 _	95%	16/25/29	20'-21 5			0.0	ML	Grayish brown sandy silt, moist, no odor			5	5	20	70				
— 25 —	95%	16/18/23	25'-26.5'			0.0	ML	Yellowish brown sandy silt with orange and gray mottling, moist, no odor				5	35	60				
— 30 –	100%	26/37/50+	30'-31.5'			0.0	SM	Greenish gray silty sand with orange-yellow mottling, moist, no odor			5	5	60	30				
— 35 —	95%	11/14/18	35'-36.5'			0.0	ML	Greenish gray sandy silt with light gray mottling, moist, no odor				10	30	60				
– 40 –	100%	13/26/42	40'-41.5'			1.0	SM	Light gray with rusty mottling silty sand, moist, no odor				5	80	15				
— 45 —	95%	45/25/50	45'-46.5'			0.0	SM	Olive gray silty sand, moist, no odor					85	15				
– 50 –	- 50%	35/50+	50'-51.5'			0.8	SP-SM	Yellowish gray poorly graded sand with silt, moist, no odor	С	5	2 5	40 M	20 F	10 FS		Т	P	S
Fie	d Tests	Dilatancy:		id S - Slo				Plasticity: N - Nonplastic L - Low M - Medium H - High Dry Strength: N - None L - Low M - Meduim H - High V - Very Hi	αh				<u> </u>					٦
—		Toughness:	L - LOW			H - High num Particle	Size is dete	Dry Strength: N - None L - Low M - Meduim H - High V - Very Hi ermined by direct observation within the limitations of sampler size.	511								_	\dashv



BORING NO.

MW-711

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Pepth (ft.) Recovery (%) Blow Counts (%) Blow	
50 Sp. 50	Plasticity
- 30 - 30% 30/301 30/31.5	
- 55 - 65% 30/50+ 55'-56.5' 0.0 SP-SM Very light gray poorly graded sand with silt, moist, no odor 5 25 40 20 10	
- 60 - 80% 35/50+ 60'-61.5' 0.0 SP Yellowish gray poorly graded sand with gravels, moist, no odor	
- 65 - 15% 17/23/50 65'-66 5' 1.2 ML Greenish gray sandy silt, moist, no odor 20 10 70	
- 70 - 100% 27/50+ 70'-71.5' III ML Light gray silt with sand with orange mottling and rusty staining normal to core, moist, no odor	
- 75 - 60% 50+ 75'-76.5' 113 SP Light gray poorly graded sand, moist, strong odor 10 75 10 5	
- 80 - 50% 50+ 80'-81 5' 5.4 SP-SM Greenish gray poorly graded sand with silt, moist, slight odor C 5 25 60 10 C F C M F FS D T P	P S
Field Tests Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High	
Toughness: L - Low M - Medium H - High Dry Strength: N - None L - Low M - Medium H - High V - Very High NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.	



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	Plasticity Strength
80 - 50% 50+ 80'-81.5' 5.4 SP.SM Granish 5 25 60 10	Plasi
SP-SM Greenish gray poorly graded sand with silt, moist, slight odor	
— 85 — 70% 20/33/47 85'-86.5' SP Greenish gray poorly graded sand, moist, slight odor 5 50 40 5	
- 90 - 85% 50+ 90'-91.5' 33.8 SP Light gray poorly graded sand, moist, odor 5 55 35 5	
- 95 - 90% 25/50+ 95'-96.5' 270 ML Dark olive gray sandy silt, moist, strong odor 5 25 70	
- 100 - 65% 25/50+ 100'-101.5' 4398 SP Light gray poorly graded sand, moist, strong odor 50 40 10	
- 105 - 100% 9/15/18 105'-106.5' 40 ML Light olive brown silt with sand, moist, odor 3 7 5 10 75	
- 110 - 100% 15/23/33 110'-111.5' 33 ML Light gray silt with sand, very moist, odor 20 80 C F C M F FS D T	P S
Field Tests Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High	
Toughness: L - Low M - Medium H - High Dry Strength: N - None L - Low M - Meduim H - High V - Very High NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.	
NOTE: Soil identifications based on ASTM Method D2248 "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)"	



BORING NO.

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							Visual-Manual Identification & Description		ivel		Sand			F	ield	Test
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity
- 110 -	100%	15/23/33	110'-111.5'		33	ML	Light gray silt with sand, very moist, odor					20				
							First water encountered at ~112' bgs									
- 115 	90%	7/17/40	115'-116.5'		107	SP	Gray poorly graded sand, wet, strong odor	5	5	5	50	30	5			
- 120 	90%	13/19/21	120'-121.5'		1249	SP-SM	Dark gray poorly graded sand with silt, wet, strong odor		5	10	50	25	10			
- 125 	95%	5/15/20	125'-126.5'		197	SP-SM	Olive gray poorly graded sand with silt, wet, strong odor			5	60	25	10			
- 130 	95%	7/10/16	130'-131.5'		243	SP-SM	SAA				60	30	10			
- 135 																
- 140 									F		N	F	FC	D		D
Field	d Tests	Dilatancy:	R - Rap	id S - Slow N	l - None	<u> </u>	Plasticity: N - Nonplastic L - Low M - Medium H - High	С	F	С	M	F	г5	D	T	٢

Menviron	UR	EX tal, inc				В	ORING LO	G							I	ı			712	2	
PROJECT	area con	Well Installation								MELE	ILE NO.		6	1002	-	ige		1	of		5
LOCATION		well installation 12345 Lakelan		a Springe CA							CT MGR.		-	1003- Jerem			_		_	—	_
CLIENT		Lakeland Deve								FIELD			-	Frane			—		—	—	_
CONTRACTOR		WDC, Montcla		μ.							STARTED			1/21/			_		_	_	_
DRILLER		700 1 200 1 200 1		er Dieneda Dobby	3						FINISHED		-	-	_		—		—	—	_
UNILLEN		Leau uriller. Ca		s: Ric <mark>ard</mark> o, Bobby						DATE	LINISHED		_	1/24/	2011	_	_		_	=	=
Elevation	123.57		Datum		Boring L	The second second	Hospital ~200'	A STATE OF THE PARTY OF THE PAR	CONTRACTOR OF THE PROPERTY OF												
ltem		Casing	Sampl	_	_	e & Model	_	CME		_	nmer Type	4_		ing Mu		┺		otal	Dept	h	_
Туре	112	CFA	S	NA	✓ Truc			4	Cat-Head		Safety	I□		Bento		1		4.5			
Inside Diameter (in		5-3/4"	2"	NA.	☐ ATV			무	Winch		Doughnut			Polym	er	1		13	35'		
Hammer Weight (I	ID.)	NA	140		Trac			ᅵ片	Roller Bit	4	Automatic			None		110				_	_
Hammer Fall (in.)	_	NA	30	_	Skid			J	Cutting Head			mples	Gra		San		yinc		Field	Tori	_
Depth (ft.) Reco	overy %	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	(density/consisten	cy, color	al Identification & I , GROUP NAME & SY moisture, optional o interpretation)	MBOL, m	naximum pa	A CAPER	8	% Tine			% Fines	Dilatancy	92		Γ
_ 0 _ _ 5 _ 5	95%	4/4/2009	5'		0.0	SM	4" Asphalt Hand auger first Light brown silty		moist, no odor						2(500	30				
— 10 — S	90%	17/50+	10'-11.5'		0.0	SM	Yellowish browr	ı silty sa	and, moist, no od	lor					5	70	25				
- 15 - 10	00%	23/30/35	15'-16.5'		0.0	SP-SM	Light brown poo	rly grad	ded sand with sil	t, moist	, no odor	i.			70	0 20	10				
— 20 — 5	95%	8/17/31	20'-21.5'		0.0	SP-SM	Yellowish brown	poorly	graded sand wit	h silt, n	noist, no c		С		3 62				T		

Water Level Data Sample ID Well Diagram Summary Depth in feet to: Riser Pipe **Elapsed Time** CC Cont. Core Screen Boring Depth (Linear ft.) 135 Date Time Stabilized 0, 1 (hr.) First Water Thin Wall Tube Filter Sand Sample Method Cal Mod Split Spoon Water Cuttings Undisturbed Sample Number of Samples Split Spoon Sample Grout 3888 Cuncrete BORING NO. G Geoprobe MW-712 111 Bentonite Seal **Field Tests** Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High Toughness: L - Low M - Medium H - High Dry Strength: N - None L - Low M - Meduim H - High V - Very High NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size. NOTE: Soil identifications based on ASTM Method D2248 "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)"



BORING NO.

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																est
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well Diagrar	m PID	USCS Symbol	Visual-Manual Identification & Description (density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity
_ 20 _	95%	8/17/31	20'-21 5		0.0	SP-SM	Yellowish brown poorly graded sand with silt, moist, no odor			3	62	25	10			
— 25 —	100%	19/27/38	25'-26.5'		0.0	ML	Olive gray silt with rust colored and light gray mottling, moist, no odor	3	7			10	80			
— 30 —	100%	36/50+	30'-31.5'		0.0	ML	Olive gray silt with sand light gray mottling, moist, no odor	5		5	5	10	75			
— 35 —	100%	17/23/37	35'-36.5'		0.0	SP-SM	Light gray poorly graded sand with silt with redish brown mottling, moist, no odor				5	85	10			
— 40 —	95%	18/20/35	40'-41.5'		0.0	SP-SM	Orange brown poorly graded sand with silt, moist, no odor					90	10			
— 45 —	70%	28/50+	45'-46.5'		0.0	SP-SM	Green brown poorly graded sand with silt, moist, no odor			3	12	75	10			
_ 50 _	40%	50+	50'-51.5'		0.0	SP	Yellowish-gray-brown poorly graded sand, moist, no odor			10	60	25	5			
								_	-	_	p.4	-	Ec		_	D
Field	d Tests	Dilatancy:	R - Rapi	id S - Slow	N - None		Plasticity: N - Nonplastic L - Low M - Medium H - High	С	F	С	М	F	FS	D	Т	Р



BORING NO.
MW-712

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								Visual-Manual Identification & Description	Gra	ıvel		Sand	1		Щ	Field	Test
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Wel	I Diagr	am PID (PPM)	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity
50 —	40%	50+	50'-51.5'			0.0	SP	Yellowish-gray-brown poorly graded sand, moist, no odor			10	60	25	5			
55 —	85%	50+	55'-56.5'			1.8	ML	Greenish gray silt with sand, moist, no odor					15	85			
60 —	80%	12/26/42	60'-61.5'			0.0	SP	Orange brown poorly graded sand, moist, no odor				5	90	5			
· 65 -	90%	13/27/40	65'-66.5'			8.2	SM	Brownish gray silty sand with rusty colored mottling, moist, slight odor		5			75 ¹	20			
- 70 -	65%	50+	70'-71.5'			4.3	SP-SM	Yellowish gray poorly graded sand with silt with orange hues, moist, slight odor				40	50	10			
· 75 -	80%	23/50+	75'-76.5'			45.3	SP-SM	Light gray poorly graded sand with silt, moist, odor					90	10			
• 80 –	70%	50+	80'-81.5'			2.8	SP	Light gray poorly graded sand, moist, slight odor				25	70	5			

NOTE: Soil identifications based on ASTM Method D2248 "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)"



BORING NO.

MW-712

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								Visual-Manual Identification & Description	Gra	avel		Sand				ield	Test	
De	pth (ft.)	Recovery	Blow Counts	Sample	Well Diagram	PID	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle	Se		Se	inm		10	C)	sea		£
		(%)		Depth (ft.)			Symbol	size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
H								•	%	%	%				ō	2	ä	St
r	80 -	70%	50+	80'-81.5'		2.8	SP	Light gray poorly graded sand, moist, slight odor				25	70	5				
											İ							
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											İ							
											İ							
											İ							
											İ							
H	85 -	65%	50+	85'-86.5'		4.5	SP	Greenish gray poorly graded sand, moist, slight odor			İ	10	85	5				
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I											1			ĺ				
H	90 -	55%	17/50+	90'-91.5'		4.0	SP	Gray poorly graded sand, moist, slight odor			5	20	70	5				
1											l							
											l							
I											1			ĺ				
H	95	85%	50+	95'-96.5'		26.8	SP-SM	Olive gray poorly graded sand with silt, moist, slight odor				5	85	10				
											İ							
H	100 -	60%	28/50+	100'-101.5'		128		Greenish gray, moist, strong odor										
											İ							
											İ							
I								First water at ~ 105' bgs			1			ĺ				
I														ĺ				
H	105 -	55%	50+	105'-106.5'		1901	SP-SM	Greenish gray poorly graded sand with silt, wet, strong odor	2	8	10	50	20	10				
1											l							
I											1			ĺ				
1														ĺ				
1											l							
I											1			ĺ				I
1								Dark gray poorly graded sand with silt and gravels, wet,						1				
H	110 -	85%	15/50+	110'-111.5'		1950	SP-SM	strong odor, subangular to subrounded gravels	5	10	10	50	20	5				
1											l							
1														1				
									_	Ļ	Ĺ	8.4	Ļ	FC		_	P	_
\vdash	Fie	ld Tests	Dilatancy:	R - Rap	id S-Slow I	N - None	I	Plasticity: N - Nonplastic L - Low M - Medium H - High	С	<u> </u>	С	IVI	F	1-5	D	1	Р	3
L			Toughness:		M - Medium	H - High	C!! !:	Dry Strength: N - None L - Low M - Meduim H - High V - Very Hi	gh	_	_							4
-			NOTE	: Soil identifi				ermined by direct observation within the limitations of sampler size. "Standard Practice for Description and Identification of Soils (Visual-Manual Pro	edu	re)"	_							\dashv
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BORING NO.

MW-712

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							Visual-Manual Identification & Description	Gra	avel		Sano	ł		F	ield	Test	
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
— 110 —	85%	15/50+	110'-111.5'		1950	SP-SM	Dark gray poorly graded sand with silt and gravels, wet,					20					٦
							strong odor, subangular to subrounded gravels										
					2379		SAA	5	10	10	50	20	5				_
— 115 —	100%	28/32/50+	115'-116.5'		28.6	ML	Light brown sandy silt with gray mottling, moist, odor				5	15	80				
		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					2.6.1. 2. 2					10					
																	╝
					2214	SP-SM	Dark gray poorly graded sand with silt, wet, strong odor		5	15	50	20	10				
							g, g								_		4
— 120 —	95%	50+	120'-121.5'		46.2	ML	Light grown silt with sand, wet, odor		5	2	7	10	75				
120	3370	30.	120 121.5		.0.2		Light grown sitt with sund, wet, odds		,		ľ	10	, ,				
125	95%	50+	125'-126.5'		36.9	ML	Granish brown silt wat adar	5	5	5			85				
— 125 —	95%	50+	125 -120.5		36.9	IVIL	Greenish brown silt, wet, odor	5	5)			65				
																	\dashv
– 130 –	95%	13/50+	130'-131.5'		1368	SP-SM	Dark gray poorly graded sand with silt, wet, strong odor				25	65	10				
130	93%	13/30+	130 -131.3		1300	3F-3IVI	Daik gray poorly graded saild with silt, wet, strong odor				23	03	10				
425	100/	50.			4502.0	Ch4	Dork grow silty cond. wet strong oder				_	80	15				
— 135 —	10%	50+			1503.0	SM	Dark gray silty sand, wet strong odor				5	80	15				
																	I
																	I
140																	I
— 140 —																	
																	I
															_		_]
Field	d Tests	Dilatancy:	R - Ran	id S - Slow 1	V - None		Plasticity: N - Nonplastic L - Low M - Medium H - High	С	F	С	М	F	FS	D	Т	Р	S
		Toughness:		M - Medium	H - High		Dry Strength: N - None L - Low M - Meduim H - High V - Very Hi	gh									_
		NOT	E: Soil identifi				termined by direct observation within the limitations of sampler size. "Standard Practice for Description and Identification of Soils (Visual-Manual Pro	cedu	re)"								\dashv
P.																	_

envi	MUF	REX tal, inc				В	ORING LO	oG								r	BOR MV	V-7	713	3	
PROJECT	or Central Paris Co	Well Installation	op.							MELE	LE NO.		10	003-0	Pag	10.7		1	of	5	;
LOCATION		12345 Lakelan		Fe Springs CA							CT MGR.		_	remy			_	_	_	_	_
CLIENT		Lakeland Deve								FIELD			-	ane S				_		_	_
CONTRAC	TOR	WDC, Montcla		р.							STARTED			18/2		_		_	_	_	_
DRILLER	· On	100 100 100 100		s: Ricardo, Bobby	3						FINISHED		-	19/2		_		_		_	_
Saturday all disch				3. Micardo, Bobby			10 10 00 00		14.01 28/25	DATE	THUBITED		-/	15/2	011	_	_	_	_	_	=
Elevation	128.4		Datum		Boring Lo		Hospital ~200					_	to d		_	_		_	_	_	_
Item		Casing	Samp	_		e & Model		CM		_	nmer Type	-		g Muc		╄	10	otal	Depti	n:	_
Type Inside Diame	atar (in 1	CFA 5-3/4"	S 2"		✓ Truc			7	Cat-Head Winch		Safety Doughnut	ΙĦ		olyme		ı		12	33'		
Hammer We	2.1.7	3-3/4 NA	140	1000	Trac			┢	Roller Bit	- 	Automatic			one	1			13	.3		
Hammer Fall	The state of the s	NA NA	30		Skid				Cutting Head		SUN IN VOLUNTARIA	mples fo		12.00	anua	I ID	only	_		_	_
Hammer Fai	i (iii.)	NA.	30		JKIU								Grave		Sand		7 IIIY		Field	Test	_
Depth (ft.)	Recovery %	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	(density/consiste	ncy, colo	ual Identification & r, GROUP NAME & s , moisture, optional interpretation)	SYMBOL, m	naximum pai	ticle	% Coarse	as a	E		% Fines	Dilatancy	92	Plasticity	Г
_ 5 _	100%	10/13/2020	5'		0.0	ML	4" Asphalt Hand auger fir: Dark brown sil		and, moist, no oc	dor						15	85				
_ 10 _	95%	19/25/30	10'-11.5'		0.0	SM	Greenish gray : odor	silty san	d with rusty ora	nge mott	lling, moist	t, no			5	60	35				
— 15 —	100%	20/20/30	15'-16.5'		0.0	ML	Light olive gray	sandy:	silt, moist, no od	lor				5	5	30	60				
— 20 —	100%	15/20/23	20'-21.5'		0.0	SM	Light brown sil	ty sand	with rust colore	d mottlin	g, moist, r	10			5	80	15				

CFCMFFSDTP Water Level Data Well Diagram Summary Sample ID Depth in feet to: Riser Pipe **Elapsed Time** CC Cont. Core Screen Boring Depth (Linear ft.) 133' Date Time Stabilized 0,3 (hr.) First Water Thin Wall Tube Filter Sand Sample Method Cal Mod Split Spoon Water Undisturbed Sample Cuttings Number of Samples Split Spoon Sample Grout 3888 Cuncrete BORING NO. G Geoprobe MW-713 111 Bentonite Seal Field Tests Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High

> Dry Strength: NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

N - None L - Low M - Meduim H - High V - Very High

Toughness:

L - Low M - Medium H - High

NOTE: Soil identifications based on ASTM Method D2248 "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)"



BORING NO.

MW-713

								Visual-Manual Identification & Description	Gra	avel		Sanc	1		F	ield 1	rest	
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well Diagr	ram	PID	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
_ 20 _	100%	15/20/23	20'-21 5			0.0	SM	Light brown silty sand with rust colored mottling, moist, no odor				5	80	15				
— 25 —	- 20%	50+	25'-26.5'			0.0	SP	Yellowish orange poorly graded sand, moist, no odor		5	10	55	25	5				
— 30 —	70%	7/33/50+	30'-31.5'			1.5	SP	Light gray poorly graded sand, moist, no odor			15	50	30	5				
– 35 –	65%	25/35/50+	35'-36.5'			0.0	SP	Yellowish brown poorly graded sand, moist, no odor			10	50	35	5				
– 40 –	- 50%	20/50+	40'-41.5'			1.5	SP	Light gray poorly graded sand, moist, no odor		5	15	50	25	5				
– 45 –	- 100%	27/50+	45'-46.5'			0.0	SP-SM	Greenish brown poorly graded sand with silt, moist, no odor					90	10				
– 50 –	- 55%	50÷	50'-51.5'			0.0	SP	Light gray poorly graded sand, moist, no odor				20						
Fiel	d Tests	Dilatancy:		id S - Slov			<u> </u>	Plasticity: N - Nonplastic L - Low M - Medium H - High	С	F	С	М	F	FS	D	Т	Р	S
<u> </u>		Toughness:	L - Low	M - Medi				Dry Strength: N - None L - Low M - Meduim H - High V - Very Hi	gh								_	4
				NOTE: M	ıaxim	num Particle S	size is dete	rmined by direct observation within the limitations of sampler size.										- 1



BORING NO.
MW-713

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								Visual-Manual Identification & Description	Gra	avel		Sand	į		F	ield T	est
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Wel	l Diagra	m PID (PPM)	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity
– 50 –	55%	50+	50'-51.5'			0.0	SP	Light gray poorly graded sand, moist, no odor				20	75	5			
— 55 —	85%	33/50+	55'-56.5'			0.0	SP	Light gray poorly graded sand, moist, no odor			5	55	35	5			
— 60 —	100%	10/12/20	60'-61.5'			1.2	ML	Light brown silt with sand with orange mottling, moist, no odor					15	85			
– 65 –	95%	20/50+	65'-66.5'			0.0	ML	Greenish brown silt with sand with orange mottling, moist, no odor					25	75			
— 70 —	70%	20/50+	70'-71.5'			0.0	SP	Yellowish brown poorly graded sand, moist, no odor				60	35	5			
— 75 —	85%	20/39/50+	75'-76.5'			0.0	SP-SM	Olive gray poorly graded sand with silt, moist, no odor				10	80	10			
— 80 —	75%	49/50+	80'-81.5'			1.2	SP-SM	Light olive gray poorly graded sand with silt, moist, no odor	С	F	С	М		10		Т	P S
Field	d Tests	Dilatancy: Toughness:				N - None m H - High		Plasticity: N - Nonplastic L - Low M - Medium H - High Dry Strength: N - None L - Low M - Meduim H - High V - Very Hi	σh		-	•	•				
		rougililess:	L - LOW				Size is det	ermined by direct observation within the limitations of sampler size.	ы								
		NOTI	E: Soil identifi	icatio	ns base	d on ASTM Met	hod D2248	"Standard Practice for Description and Identification of Soils (Visual-Manual Pro	edu	re)"							



BORING NO.

MW-713

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									Visual-Manual Identification & Description		avel		Sand	_			ield	Test	
De	epth	n (ft.)	Recovery	Blow Counts	Sample	Well Diagram	PID	USCS	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle	9		92	E		l	5	ess	≥	ے
			(%)		Depth (ft.)	_		Symbol	size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
H						leesed teeses			interpretation)	%	%	%	%				٩	Ы	St.
H	80	0 —	75%	49/50+	80'-81.5'		1.2	SP-SM	Light olive gray poorly graded sand with silt, moist, no odor					90	10				
									, ,										
L	85		70%	25/50+	85'-86.5'		1.7	CD CNA	Greenish gray poorly grded sand with silt, moist, no odor					00	10				
Г	0.	_	70%	23/301	65 -60.5		1.,	3F-3IVI	dieemsii gray poorty grueu sanu with siit, moist, no ouoi					30	10				
F	90	o –	60%	25/50+	90'-91.5'		2.8	SP	Dark gray poorly graded sand, moist, slight odor		5	10	55	25	5				
L	95		55%	17/27/33	95'-96.5'		1.7	SP	Dark gray poorly graded sand, moist, slight odor				50	40	10				
	٥.	_	3370	17/27/33	95-90.5		1.,	31	Dark gray poorty graded sand, moist, slight odol				30	40	10				
F	10	00 —	75%	23/50+	100'-101.5'		5.1	SP-SM	Dark gray poorly graded sand with silt, moist, slight odor				10	80	10				
1							1			ĺ		1			1				
1										ĺ		1			1				
1																			
L	10)5 —	100%	13/30/50+	105'-106.5'		91.9	SM	Dark gray silty sand with orange mottling, moist, odor				5	55	40				
	-			,					3 , 1 1, 11 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1				١						
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r	11	.0 —	25%	12/25/53	110'-111.5'		134	SP-SM	Dark gray poorly graded sand with silt, wet, strong odor				30	60	10				
									First water at ~110' bas	1		1			1				
1									First water at ~110' bgs										
1												L			L		_		_
\vdash		Field	d Tests	Dilatancy:	R - Ran	id S - Slow I	N - None]	Plasticity: N - Nonplastic L - Low M - Medium H - High	С	F	С	М	F	FS	D	Т	Р	S
L				Toughness:		M - Medium			Dry Strength: N - None L - Low M - Meduim H - High V - Very Hi	gh									
						NOTE: Maxi	imum Particle		ermined by direct observation within the limitations of sampler size.										1
L				NOTE	: Soil identifi	cations based	on ASTM Met	nod D2248	"Standard Practice for Description and Identification of Soils (Visual-Manual Pro	cedu	re)"								



BORING NO.

MW-713

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							Visual-Manual Identification & Description	Gra	avel		Sand			F	ield ⁻	Test	
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
- 110 -	25%	12/25/53	110'-111.5'		134	SP-SM	Dark gray poorl graded sand with silt, wet, strong odor				30	60	10				
– 115 –	90%	14/50+	115'-116.5'		113	SP-SM	Dark gray poorly graded sand with silt, wet, strong odor			5	60	25	10				
— 120 —	70%	7/13/17	120'-121.5'		107	SP-SM	SAA			5	65	20	10				
— 125 —	80%	8/12/15	125'-126.5'		92	SP	Dark gray poorly graded sand, wet, strong odor			5	70	20	5				
— 130 —	75%	10/15/19	130'-131.5'		94	SP	SAA		3	7	65	20	5				
— 135 —																	
— 140 —	d Tests	Dilatanov	D 000	id S Slow	N - None		Placticity: N. Nopolastic I Joy M. Medium H. High	С	F	С	M	F	FS	D	T	P	S
Field		Dilatancy: Toughness:		id S - Slow 1 M - Medium			Plasticity: N - Nonplastic L - Low M - Medium H - High Dry Strength: N - None L - Low M - Meduim H - High V - Very Hi	gh									
							termined by direct observation within the limitations of sampler size.										┚
		NOT	E: Soil identif	cations based	on ASTM Met	nod D2248	"Standard Practice for Description and Identification of Soils (Visual-Manual Pro	cedu	re)"								_

envi	MUF	REX tal, inc				В	ORING L	OG						\prod		M	w	IG N	4	
PROJECT LOCATION CLIENT		Well Installation 12345 Lakelan Lakeland Deve	d Rd, Santa I								ILE NO. CT MGR. REP.		Jere	3- <mark>0</mark> 01	Page 1-200 quire sic)	1	of		5
CONTRAC DRILLER	TOR	WDC, Montcla Lead driller: Ea	CONTRACTOR AND ADDRESS OF THE PARTY OF THE P	s: Ricardo, Bobby							STARTED FINISHED		200000000	9/201 0/201	-	_	_	_	<u> </u>	_
Elevation Item	129.0	7 ft. Casing	Datum Samp	ler Core Barrel	Boring L Rig Mak	ocation e & Model	Hospital near	MW-607 CME	95	Har	nmer Type	Dr	illing N	Mud	$\overline{}$	_	Total	al Dep	oth	_
Type Inside Diame Hammer We	eight (lb.)	CFA 5-3/4" NA	2" 140	NA NA	Tru ATV	/ [dk [Geoprobe		Cat-Head Winch Roller Bit		Safety Doughnut Automatic		Poly: None		40		1	.43	(
Hammer Fal Depth (ft.)	Recovery %	NA Blow Counts	Sample Depth (ft.)	Well Diagram	PID Skid	USCS Symbol	Vi (density/consist	ency, color	Cutting Head Jal Identification & GROUP NAME & moisture, optional interpretation)	Description	o <mark>n</mark> naximum par		ravel	S	and E			Toughness	Plasticity ea	T
- 0 -	100%	16/50+	5'		0.0	SM/ML	4" Asphalt Hand auger fir Yellowish brov roots		and/sandy silt, r	noist, no	odor, tree				10 4	40 5	60			
_ 10 _	75%	5/8/11	10'-11.5'		0.0	SM	Yellowish brov moist, no odo	1/2	and with rust ar	d brown	mottling,			j	25 5	50 2	!5			
— 15 —	60%	8/12/18	15'-16.5'		0.0	SM	Yellowish brov	vn silty s	and, moist, no o	dor					15 6	55 2	<u>!</u> O			

85% 20'-21.5' 15/30/33 SP-SM Yellowish brown poorly graded sand with silt, moist, no odor 20 0.0 Sample ID Well Diagram Water Level Data Summary Depth in feet to: Riser Pipe **Elapsed Time** CC Cont. Core Screen Boring Depth (Linear ft.) 143' Time Stabilized Date (hr.) First Water Thin Wall Tube Filter Sand Sample Method Cal Mod Split Spoon Water 0, Undisturbed Sample Cuttings Number of Samples Split Spoon Sample Grout 3888 BORING NO. Cuncrete G Geoprobe MW-714 111 Bentonite Seal **Field Tests** R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High Dilatancy: Toughness: L-Low M-Medium H-High Dry Strength: N - None L - Low M - Meduim H - High V - Very High

NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

NOTE: Soil identifications based on ASTM Method D2248 "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)"



BORING NO.

MW-714

ge 2 of 5

							Vieual Manual Identification C Berndetter	Gra	avel		Sano	1		-	Field 1	Γest	\dashv
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	Visual-Manual Identification & Description (density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)		% Fine		% Medium		% Fines	Dilatancy	S		Strength
20	85%	15/30/33	20'-21 5		0.0	SP-SM	Yellowish brown poorly graded snad with silt, moist, no odor		5			20	10				
— 25 —	70%	17/20/37	25'-26.5'		0.0	SP-SM	SAA			10	30	50	10				
— 30 —	80%	20/29/31	30'-31.5'		0.0	SP	Yellowish brown poorly graded sand, moist, no odor			5	35	55	5				
— 35 —	15%	15/50+	35'-36.5'		0.0	SW-SM	Light gray well graded sand with silt and gravels, moist, no odor	3	12	25	30	20	10				
— 40 —	85%	25/50+	40'-41.5'		0.0	GP	Olive gray poorly graded gravel with sand, moist, no odor	25	40	15	10	5	5				
— 45 —	10%	50+	45'-46.5'		0.0	SP	Yellowish gray poorly graded sand, moist, no odor			5	35	55	5				
– 50 –	90%	25/35/40	50'-51.5'		0.0	SP	Yellowish gray poorly graded sand, moist, no odor	С	F	С	20 M	75 F	5 FS		Т	P	S
Field	d Tests	Dilatancy: Toughness:		id S - Slow M - Medium			Plasticity: N - Nonplastic L - Low M - Medium H - High Dry Strength: N - None L - Low M - Meduim H - High V - Very H	igh									
				NOTE: Maxi	mum Particle		rmined by direct observation within the limitations of sampler size.		***						_	_	╛
		NOTE	: Soil identific	ations based o	on ASTM Meth	od D2248	"Standard Practice for Description and Identification of Soils (Visual-Manual Proc	edur	e)"								_



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Popular Popu										Visual-Manual Identification & Description	Gra	avel		Sanc	ł			ield	Гest	
### SS = 85% 7/591 55:56.57	Depth (ft.)		Blow Counts		Wel	I Diag	ram	PID (PPM)		(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
### Poly	— 50 —	90%	25/35/40	50'-51.5'				0.0	SP	Yellowish gray poorly graded sand, moist, no odor				20	75	5				٦
- 05 - 80% 30/50 65'-66.5'	– 55 –	• 85%	7/50+	55'-56 5'				0.0	SP-SM	Reddish brown poorly graded sand with silt, moist, no odor				25	65	10				
- 70 - 90% 22/29/40 70'-71.5' 977 ML Dark gray silt with sand, moist, strong odor, visible staining 225 75	– 60 –	60%	17/31/40	60'-61.5'				0.0	SP-SM			5	10	50	25	10				
Field Tests Dilatancy: Toughness: Coulombers: R-Rapid S-Slow N-None Plasticity: Dry Strength: NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size. SP-SM Olive gray poorly graded sand with silt, moist, strong odor 15 75 10 1 1 P S C F C M F F S D T P S N-None L-Low M-Medium H-High Dry Strength: N-None L-Low M-Medium H-High Dry Strength: N-None L-Low M-Medium H-High	– 65 –	- 80%	30/50+	65'-66 5'				0.0	SW-SM			20	20	30	20	10				
SP-SM Greenish gray poorly graded sand with silt, moist, strong odor SP-SM Greenish gray poorly graded sand with silt, moist, strong odor 15 75 10 15 75 10 1	– 70 –	90%	23/29/40	70'-71.5'				977	ML	Dark gray silt with sand, moist, strong odor, visible staining					25	75				
Field Tests Dilatancy: Toughness: Dilatancy: R - Rapid S - Slow N - None Toughness: L - Low M - Medium H - High Dry Strength: NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.	– 75 –	95%	23/30/41	75'-76.5'				2.3	SP-SM	Olive gray poorly graded sand with silt, moist, slight odor					90	10				
Field Tests Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High Toughness: L - Low M - Medium H - High Dry Strength: N - None L - Low M - Medium H - High V - Very High NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.	– 80 –	90%	28/50+	80'-81 5'				231	SP-SM			-						_	D	
NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.	Fiel	d Tests							<u>I</u>			Г	٠	IVI	Г	1.2	U	•	•	٦
	<u> </u>		Toughness:	L - Low					Size is det		gh									\dashv
			NOT	E: Soil identifi							cedu	re)"							_	╛



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Field Test Visual-Manual Identification & Description Sample USCS (density/consistency, color, GROUP NAME & SYMBOL, maximum particle Depth (ft.) % Medium Blow Counts Well Diagram PID (%) Depth (ft.) Symbol size*, structure, odor, moisture, optional descriptions, geologic % Fine interpretation) Greenish gray poorly graded sand with silt, moist, strong 80 90% 28/50+ 80'-81.5' 231 15 SP-SM 85 35/50+ 85'-86.5' 1.8 SP-SM SAA 10 80 10 80% 90 95% 15/50+ 90'-91.5' 196 Olive gray silt with sand, moist, odor 25 30/43/50+ 95'-96.5' SP-SM Dark gray poorly graded sand with silt, moist, slight odor 95 90% 2.1 90 10 15 75 10 100 100'-101.5' SP-SM Dark gray poorly graded sand with silt, moist, odor 15/50+ 100 90% 105 31/50+ 105'-106.5' 18.5 Gray silty sand, moist, slight odor 5 15 60 20 110'-111.5' 110 • 75% 24/50+ 21 SP-SM Greenish gray poorly graded sand with silt, moist, slight odor 40 40 3 7 C F C M F FS D T P S Field Tests Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High L - Low M - Medium H - High Dry Strength: N - None L - Low M - Meduim H - High V - Very High NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size. NOTE: Soil identifications based on ASTM Method D2248 "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)"



BORING NO.

MW-714

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							Visual-Manual Identification & Description	Gra	avel		Sand			F	ield T	est
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity
110	75%	24/50+	110'-111.5'		21	SP-SM	Greenish gray poorly graded sand with silt, moist, slight odor		3	7	40	40	10			
											1					
											1					
											1					
115 —	80%	50+	115'-116.5'		505	SP-SM	Gray poorly graded sand with silt, wet, strong odor				40	50	10			
							First water at ~115' bgs				1					
												+				-
											1					
120 —	95%	25/50+	120'-121.5'		304	ML	Gray silty sand, wet, strong odor				35	50	15			
											1					
																+
											1					
125	95%	15/50+	125'-126.5'		393	SM	Very light gray silty sand, wet, strong odor				1	70	30			
											1					
											1					
120	450/	50.	4201 424 51		204	CNA	Dayle alive grow silty cond. wet strong oder					75	20			
130 —	45%	50+	130'-131.5'		381	SM	Dark olive gray silty sand, wet, strong odor				5	/5	20			
											1					
											1					
135	100%	11/30/50+			128	SM	Dark gray silty sand, wet, strong odor				1.5	80	15			
133	100%	11/30/30			120	5	Bank gray sinty sand, wee, salong odol						13			
											1					
140	85%	11/20/50+			229	SM	SAA				25	60	15			
								С	F	C.	М	_ F	FS	D	Т	P
Field	d Tests	Dilatancy:	R - Rap	id S - Slow 1	N - None	<u> </u>	Plasticity: N - Nonplastic L - Low M - Medium H - High			_		_	-	- 1		_

NOTE: Soil identifications based on ASTM Method D2248 "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)"

envi	MUI	REX ital, inc				В	ORING LO	oG											NO. 15		
PROJECT		Well Installati	on							MEI FI	LE NO.		100	3-00	Page 1-20		1		of	5	
LOCATION	U.	12345 Lakelar	nd Rd, Santa I	Fe Springs, CA						PROJE	CT MGR.		Jere	emy S	quir	re					
CLIENT		Lakeland Deve	elopment Co	rp.						FIELD I	REP.		Frai	ne Sc	sic						
CONTRAC	TOR	WDC, Montcla	air, CA							DATES	TARTED		1/2	6/20	11						
DRILLER		Lead driller: Ea	arnie; Helper	s: Ricardo, Bobby						DATE I	INISHED		1/2	7/20	11						
Flevation	116.6	5 ft	Datum		Boring L	ocation	Hospital near	MW-608					_						_	=	Ξ
	110.0			ler Core Barrel					95	Ham	mer Tyne	Dr	illing	Mud	\neg		To	stal D	epth		-
					_		_					_	_			_	-	7.01.0	cpui	_	-
	eter (in.)							ΙĦ							0			13	5'		
		1,715,711	3.5	1 1/2/	372/27	_		片	Market Name of the Control of the Co		A CONTRACTOR		233		- 1						
Hammer Fal	(in.)		117								SCHOOL VALUE OF A	nples for	1277	- 0	iual	ID or	nly		_	_	_
CONTRACTOR DRILLER MDC, Montclair, CA Lead driller, Earnie; Helpers: Ricardo, Bobby DaTE STARTED 1/25/2011	-	F	rield T	est	-																
Depth (ft.)	Recovery %	Blow Counts	The Charles	Well Diagram	PID	A STATE OF THE PARTY OF THE PAR	(density/consiste	ncy, colo	r, GROUP NAME & S , moisture, optional	YMBOL, m	aximum par	ticle	Т		П	% Fine	% Fines	T	92	Plasticity	***************************************
– 0 –							4" Asphalt							ll			-1	- 1	П	-	
							and the same of th							ll	- 1		- 1				
							Hand auger fire	t 5 feet				- 1		ll	- 1		- 1	- 1			
												- 1		ll	- 1		- 1	1			
						C1.4	2 EVD 2/C JJ.	بماند لديد		- dec		- 1		ı	_	70	25	- 1			
				11818118		SIVI	2.51K 3/6 dark	rea siit	y sand moist, no	odor		- 1		П	5	10	25	- 1			
												- 1		ll	- 1		- 1	- 1			
												- 1		ll	- 1		ı	- 1			
												- 1		ı				- 1			
- 5 -	100%	7/10/2012	5'		0.0	SM	10YR 6/3 pale	brown s	ilty sand, moist,	no odor		- 1		ll	5	75	20	- 1			
												- 1		ı	- 1			- 1			
												- 1		ll	- 1		- 1	- 1			
												- 1		ll	- 1		- 1				
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												- 1		ll	- 1		- 1	- 1			
												- 1		ll	- 1		- 1	- 1			
														ll	- 1		- 1	- 1			
							10YR 5/4 vello	wish bro	wn poorly grade	ed sand w	ith silt.			ı				- 1			
_ 10 _	100%	15/26/27	10'-11.5'		0.0	SP-SM	Commercial Services assured		wiii poorily grade	a Julia W	icii siic,			ш	5	85	10	- 1			
							moist, no odor										П	- 1			
												- 1		ı	- 1		- 1	- 1			
												- 1		ll	- 1		- 1				
												- 1		ll	- 1		- 1	- 1			
												- 1		ll	- 1		- 1	- 1			
												- 1		ll	- 1		- 1	- 1			
												- 1		ll	- 1		- 1	- 1			
												- 1		ll	- 1		- 1	- 1			
_ 15 _	0%	17/26/27	15'-16.5'		NA		No Recovery					- 1		ll	- 1		- 1	- 1			
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																	1				
70	95%	20/25/27	20'-21.5'		0.0	SP	10YR 6/4 brow	nish yel	low poorly grade	ed sand, r	noist, no				5	90	5				
_ 20 _	3370	20/23/27	20-21.3		0.0	31	odor														
												C	F	C	M	F	FS	D	T	Р	

				19.7					CF	C M F FS D T P	t
		Water Level De	eta			Sample ID		Well Diagram	S	ummary	_
		0 2	Depth ii	n feet to:	474.00	38 1 2	П	Riser Pipe	AS THERMAL DIA	9.007	Ī
Date	Time	Elapsed Time (hr.)	First Water	Stabilized Water	T U	Cont. Core Thin Wall Tube Undisturbed Sample	92. 1938	Screen Filter Sand Cuttings	Boring Depth (Linear ft.) Sample Method Number of Samples	135' Cal Mod Split Spoon	-
					S G	Split Spoon Sample Geoprobe	ZZ	Cuncrete Bentonite Seal	BORING NO.	MW-715	
Field T	oete Di	latance	D Danid C C	low N None		Placticity	M	- Monnlactic I -	ow M. Modium H. High		-

L - Low M - Medium H - High Dry Strength: N - None L - Low M - Medium H - High V - V

NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

NOTE: Soil identifications based on ASTM Method D2248 "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)"



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							Visual-Manual Identification & Description	Gra	avel		Sanc	1		F	ield	Test	\exists
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well Diagra	am PID	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
_ 20 _	95%	20/25/27	20'-21 5		0.0	SP	10YR 6/4 brownish yellow poorly graded sand, moist, no odor				5	90	5				
						ML	2.5YR 5/4 reddish brown silt with sand, moist, no odor			10	10	5	75				
– 25 –	75%	15/30/30	25'-26.5'		0.0	SP	5YR 6/2 pinkish gray poorly graded sand, moist, no odor		5	15	25	50	5				
— 30 —	10%	10/50+	30'-31.5'		0.0	SP	SAA										
25	050/	25/50	251.26.51		0.0	6.0	soup s/a			10	25	60	۰				
— 35 —	85%	25/50+	35'-36.5'		0.0	SP	10YR 6/1 gray poorly graded sand, moist, no odor			10	25	60	5				
— 40 —	100%	50/18/21	40'-41.5'		0.0	ML	2.5Y 5/1 gray silt with sand, moist, no odor	5	5	5	5		80				
— 45 —	100%	22/22/23	45'-46.5'		0.0	SP-SM	5Y 4/3 olive poorly graded sand with silt, moist, no odor				10	80	10				
																	į
– 50 –	100%	23/28/30	50'-51.5'		0.0	SM	5Y 4/1 dark gray silty sand with rusty-brown mottling, moist, no odor				15	70	15				
								С	F	С	М	F	FS	D	Т	P	S
Field	d Tests	Dilatancy: Toughness:			/ N - None um H - High		Plasticity: N - Nonplastic L - Low M - Medium H - High Dry Strength: N - None L - Low M - Meduim H - High V - Very Hi	gh						•			٦
		-				Size is deta	ermined by direct observation within the limitations of sampler size.	_		_		_					_



BORING NO.
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								Visual-Manual Identification & Description	Gra	avel		Sano	1		F	ield	Test	
Depth (ft.)	Recovery	Blow Counts	Sample	Mol	l Diagram	PID (PPM)	uscs	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle			l	Ε				SS		- 1
Deptii (it.)	(%)	blow counts	Depth (ft.)	WE	Diagram	rib (FFIVI)	Symbol	size*, structure, odor, moisture, optional descriptions, geologic	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	ghne	Plasticity	ngth
								interpretation)	%	%	%	%	% Fi	% FI	Dila	Tou	Plas	Stre
– 50 –	100%	23/28/30	50'-51.5'			0.0	SM	5Y 4/1 dark gray silty sand with rusty-brown mottling, moist,				15	70	15	l			
								no odor										
_ 55 _	50%	50+	55'-56.5'			0.0	SP	5Y 6/4 pale olive poorly graded sand, moist, no odor				5	90	5				
	3070		33 30.3			"	J.	graded surface from graded surface, moist, no oddr					50					
- 60 -	C00/	FO:	CO! C1 E!			0.0	c n	EV 7/2 light grow nearly graded sand, maist, slight adar			Ļ	25	٥.	١,				
— 60 —	60%	50+	60'-61 5'			0.0	SP	5Y 7/2 light gray poorly graded sand, moist, slight odor			5	25	65	5				
								2.5Y 4/4 olive brown poorly graded sand with silt with brown										
— 65 —	95%	24/26/34	65'-66.5'			0.0	SP-SM	and gray mottling, moist, slight odor				10	80	10				
								and gray motering, moist, slight odor										
																		1
									H	\forall	-	-			\vdash	\dashv	\dashv	_
								10YR 4/4 dark yellowish brown sandy silt with gray mottlilng,										
— 70 —	100%	20/28/30	70'-71.5'			4.3	ML	very moist, slight odor				10	20	70				
								very moist, slight odor										
								Water encountered at ~70' - 75' bgs										
								and the second of the second o										
															i			
75	95%	10/19/35	75'-76.5'			1.2	ML	7.5YR 4/6 strong brown silt with sand, wet, no odor					10	90	s	М	М	٧
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80 —	85%	50+	80'-81 5'			1.2	SP-SM	10YR 6/4 light yellowish brown poorly graded sand with silt,				55	35	10	1			
30 _	03/0	30.	30 313				3. 33141	wet, no odor				55	رر	10	1			
									1						1			
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	<u> </u>	L		ļ					С	F	С	M	F	FS	D	Τ	Р	S
Field	d Tests	Dilatancy:				N - None		Plasticity: N - Nonplastic L - Low M - Medium H - High	íah									
		Toughness:	L - LOW			n H - High	Size is det	Dry Strength: N - None L - Low M - Meduim H - High V - Very Hi ermined by direct observation within the limitations of sampler size.	БII	—	—				—	—	—	_
		NOT	E: Soil identifi					"Standard Practice for Description and Identification of Soils (Visual-Manual Pro	cedu	re)"	_				_	_	_	7
										<u>-,</u>								_



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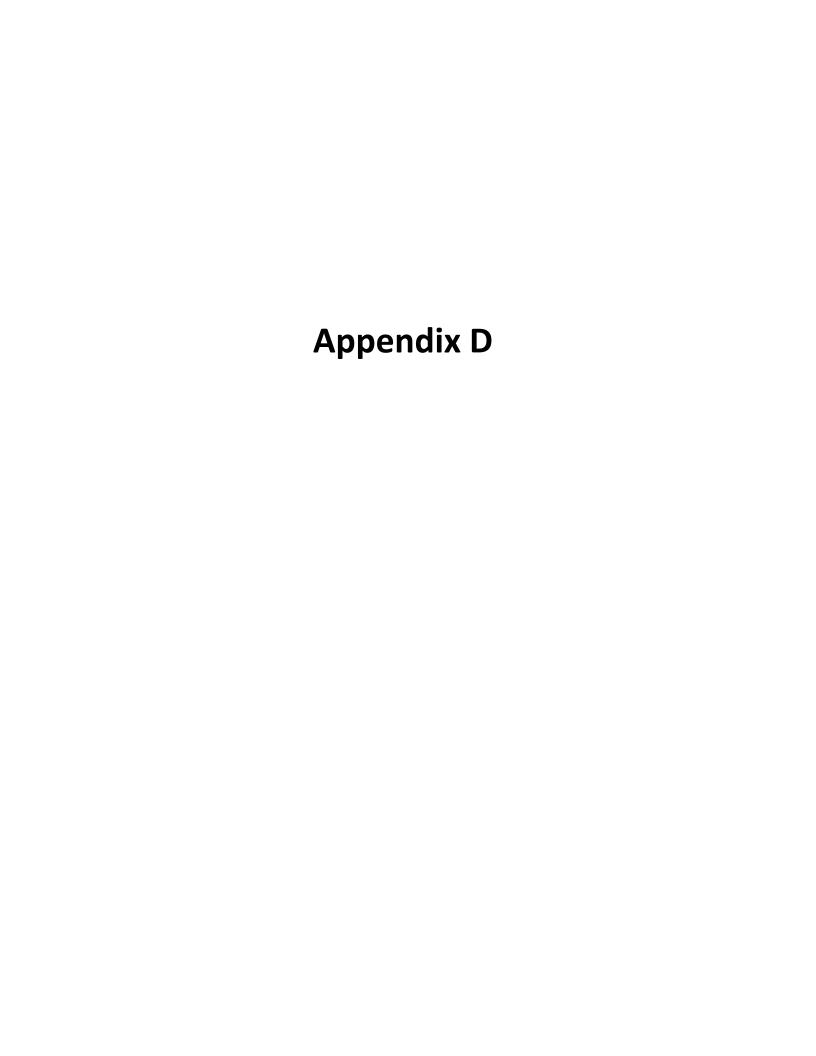
							Visual-Manual Identification & Description	Gra	avel		Sand			F	ield T	est
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity Strength
— 80 —	85%	50+	80'-81.5'		1.2	SP-SM	10YR 6/4 light yellowish brown poorly graded sand with silt, wet, no odor				55	35	10			
– 85 –	- 100%	20/27/35	85'-86.5'		0.0	SM	2.5Y 5/4 light olive brown silty sand, very moist, no odor					75	25			
– 90 –	70%	50+	90'-91.5'		0.0	SP-SM	2.5Y 4/4 olive brown poorly graded sand with silt, very moist, no odor					90	10			
– 95 –	15%	50+	95'-96.5'		1.2	SP	2.5Y 6/6 olive yellow poorly graded sand, moist, slight odor			5	65	25	5			
— 100 –	15%	50+	100'-101.5'		1.5	SP	5Y 7/1 light gray poorly graded sand, moist, no odor				5	90	5			
— 105 —	90%	15/50+	105'-106.5'		12.2	SP	2.5Y 5/1 gray poorly graded sand, wet, slight odor				25	70	5			
_ 110 _	100%	15/50+	110'-111.5'		79.2	SP	SAA, w/ more obvious odor Groundwater encountered at $^\sim$ 110' bgs	С	F		20 M			D	Т	P S
Fie	d Tests	Dilatancy: Toughness:		id S - Slow N M - Medium			Plasticity: N - Nonplastic L - Low M - Medium H - High Dry Strength: N - None L - Low M - Meduim H - High V - Very Hi	gh								
				NOTE: Maxi	mum Particle		ermined by direct observation within the limitations of sampler size.									
		NOTE	E: Soil identifi	cations based o	on ASTM Metl	nod D2248	"Standard Practice for Description and Identification of Soils (Visual-Manual Prod	edui	re)"							



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							Visual-Manual Identification & Description	Gra	ivel		Sand			F	ield 1	Test	
Depth (ft.)	Recovery (%)	Blow Counts	Sample Depth (ft.)	Well Diagram	PID	USCS Symbol	(density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
— 110 —	100%	15/50+	110'-111.5'		79.2	SP	SAA, w/ more obvious odor			5	20	70	5				
— 115 —	95%	20/50+	115'-116.5'		74.5	SP	2.5Y 5/1 gray poorly graded sand, wet, moderate odor	5	5	15	50	20	5				
— 120 —	90%	8/21/50+	120'-121.5'		58	SP-SM	10YR 5/1 gray poorly graded sand with silt, wet, moderate odor			5	60	25	10				
— 125 —	100%	10/18/20	125'-126.5'		53.2	SP	10YR 5/1 gray poorly graded sand, wet, moderate odor		5	15	60	15	5				
— 130 —	90%	11/16/25	130'-131.5'		91.6	SP	SAA			5	65	25	5				
– 135 –																	
— 140 —								С	F	С	М	F	FS	D	Т	P	S
Fiel	d Tests	Dilatancy: Toughness:		id S - Slow N M - Medium			Plasticity: N - Nonplastic L - Low M - Medium H - High Dry Strength: N - None L - Low M - Meduim H - High V - Very Hi	gh									
				*NOTE: Max	imum Particle		termined by direct observation within the limitations of sampler size.										╛
		NOT	E: Soil identifi	cations based	on ASTM Met	hod D2248	"Standard Practice for Description and Identification of Soils (Visual-Manual Pro	cedu	re)"								╝



Site: Santa Fe Springs, CA

Client: ARCADIS

Date/Time: 7/22/2009 @ 8:41:01 AM

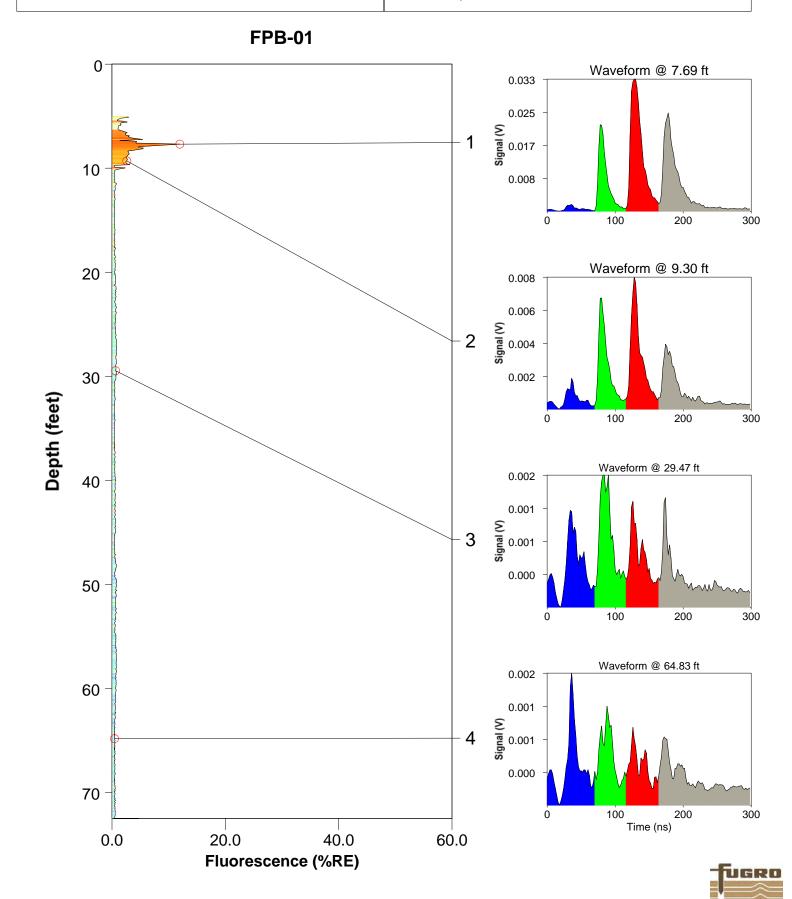
ROST Unit: 1

Operator: M. Parras

Fugro Job #: 04.0909-0040

Max fluorescence: 11.97% @ 7.69 ft

Final depth BGS: 103.88 ft



Site: Santa Fe Springs, CA

Client: ARCADIS

Date/Time: 7/22/2009 @ 8:41:01 AM

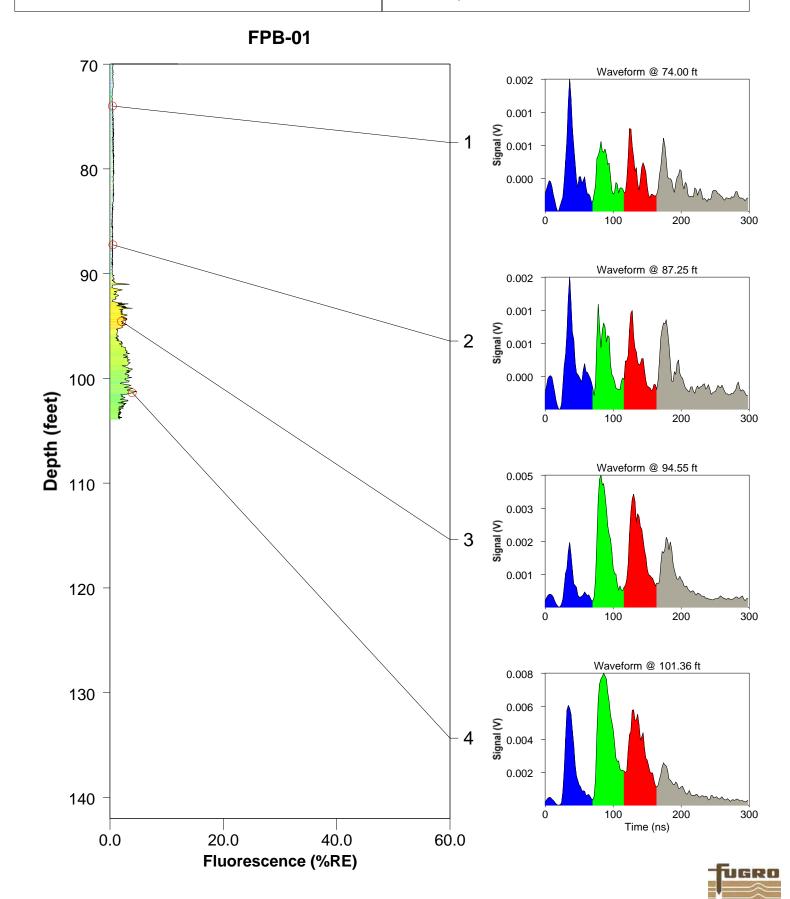
ROST Unit: 1

Operator: M. Parras

Fugro Job #: 04.0909-0040

Max fluorescence: 11.97% @ 7.69 ft

Final depth BGS: 103.88 ft



Site: Former CENCO Refinery

Client: ARCADIS BBL

Date/Time: 2/21/2008 @ 3:53:52 PM

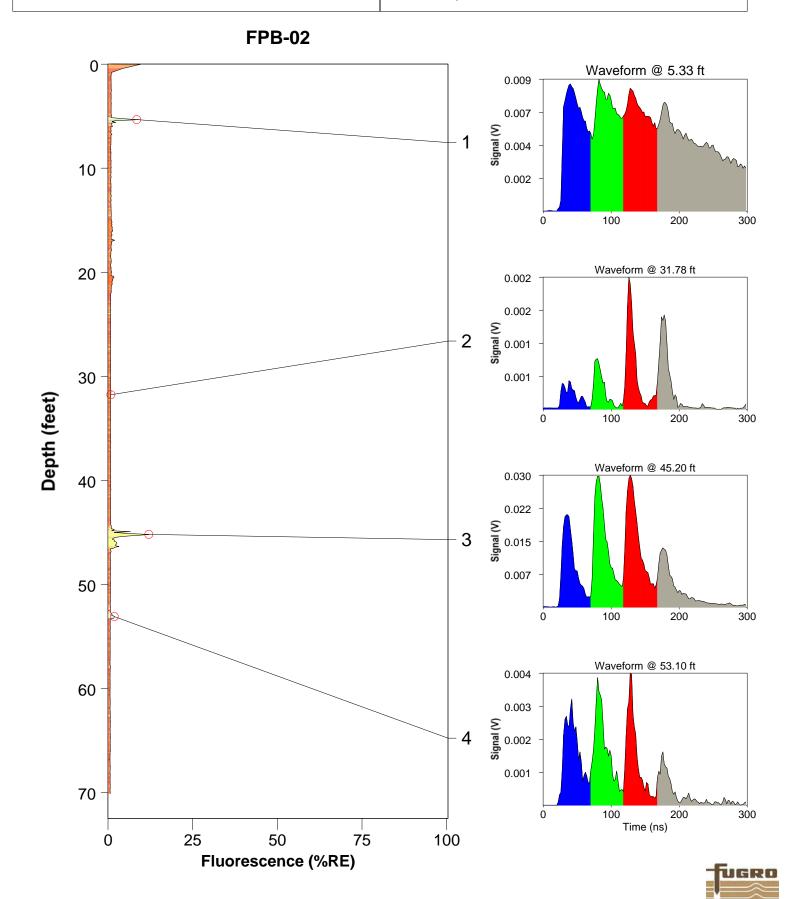
ROST Unit: 1

Operator: MITCH

Fugro Job #: 04.0908-0011

Max fluorescence: 11.65% @ 45.20 ft

Final depth BGS: 70.10 ft



Site: Santa Fe Springs, CA

Client: ARCADIS

Date/Time: 7/22/2009 @ 1:17:51 PM

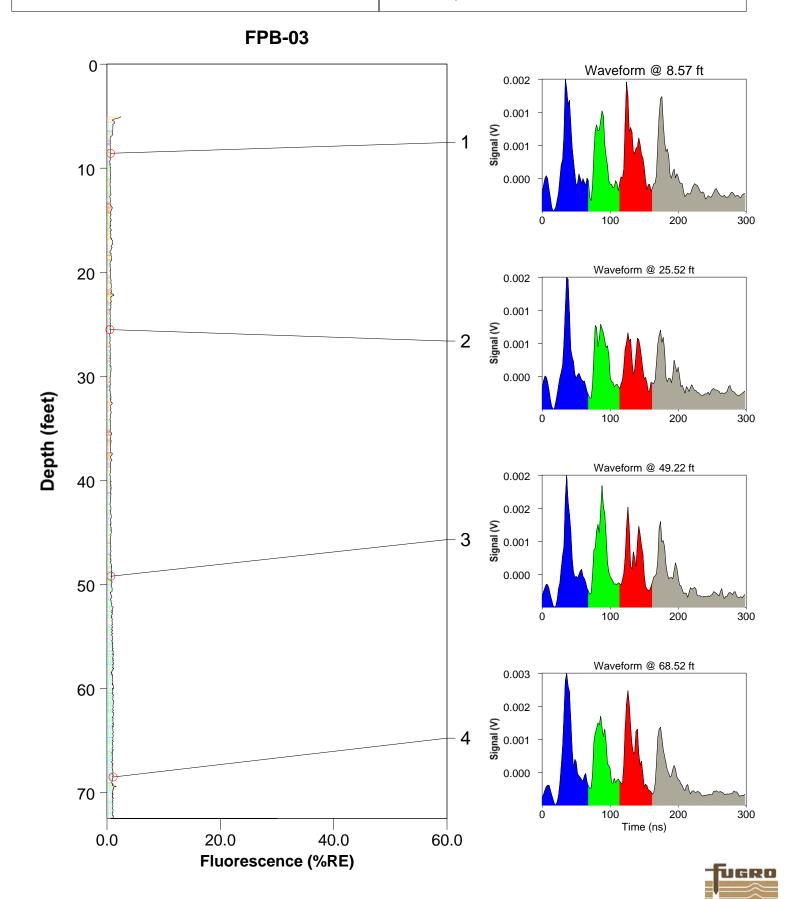
ROST Unit: 1

Operator: M. Parras

Fugro Job #: 04.0909-0040

Max fluorescence: 30.04% @ 95.53 ft

Final depth BGS: 105.04 ft



Site: Santa Fe Springs, CA

Client: ARCADIS

Date/Time: 7/22/2009 @ 1:17:51 PM

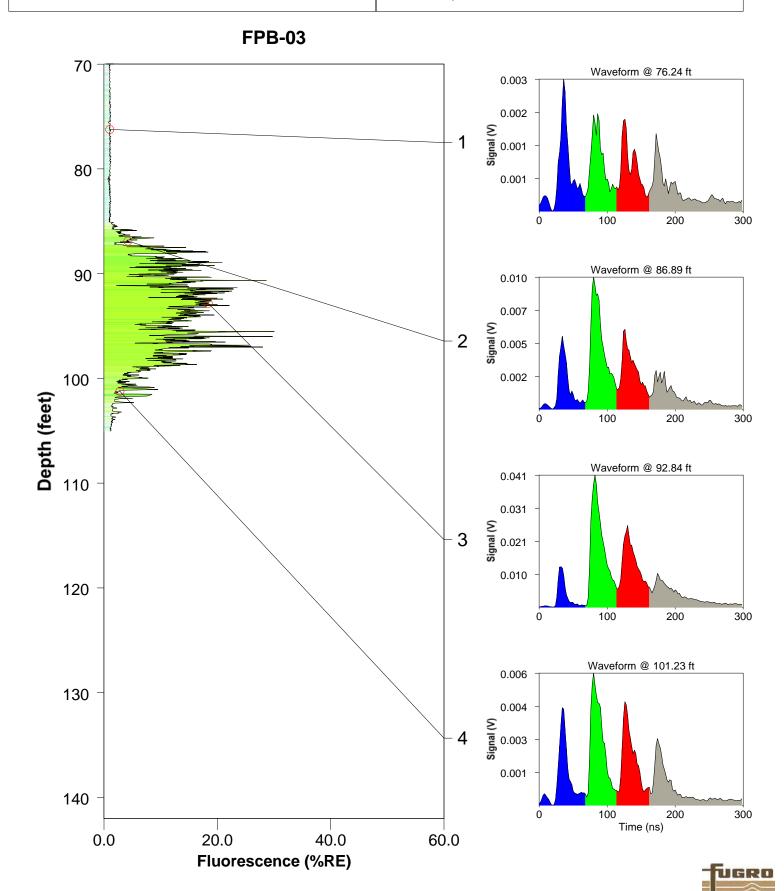
ROST Unit: 1

Operator: M. Parras

Fugro Job #: 04.0909-0040

Max fluorescence: 30.04% @ 95.53 ft

Final depth BGS: 105.04 ft



CPT Data



Job Number 04.0909-0040

CPT Number FPB-04R

Location Santa Fe Springs-CA

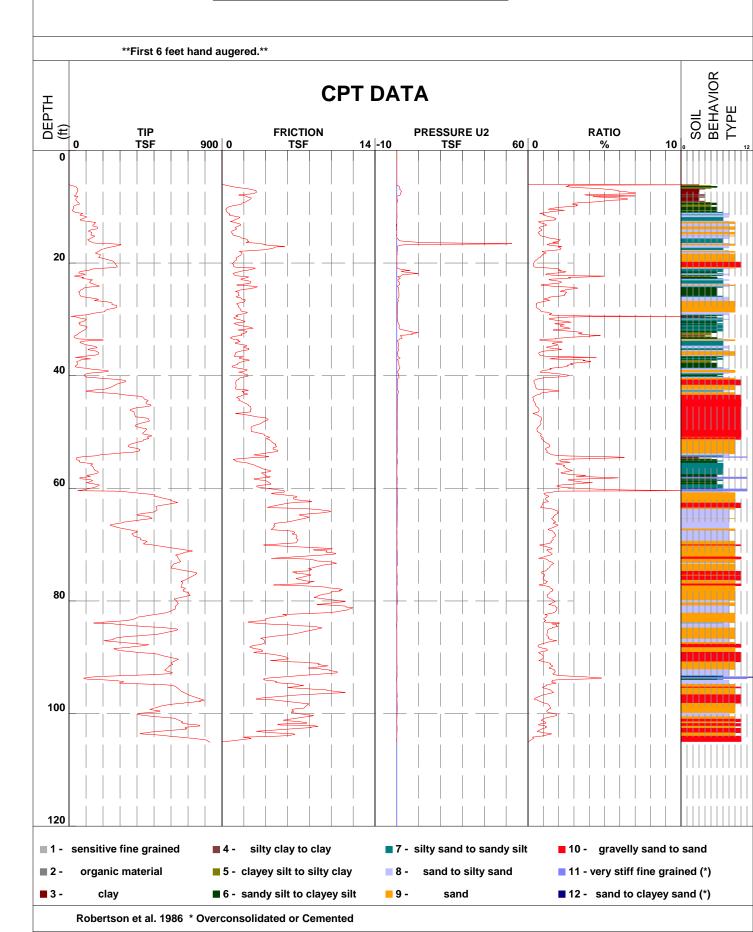
Operator

M. Parras

Date and Tim 24-Jul-2009 12:20:30

Client ARCADIS

Cone Number F7.5CKE2HAW21165



Site: Santa Fe Springs, CA

Client: ARCADIS

Date/Time: 7/24/2009 @ 10:21:25 AM

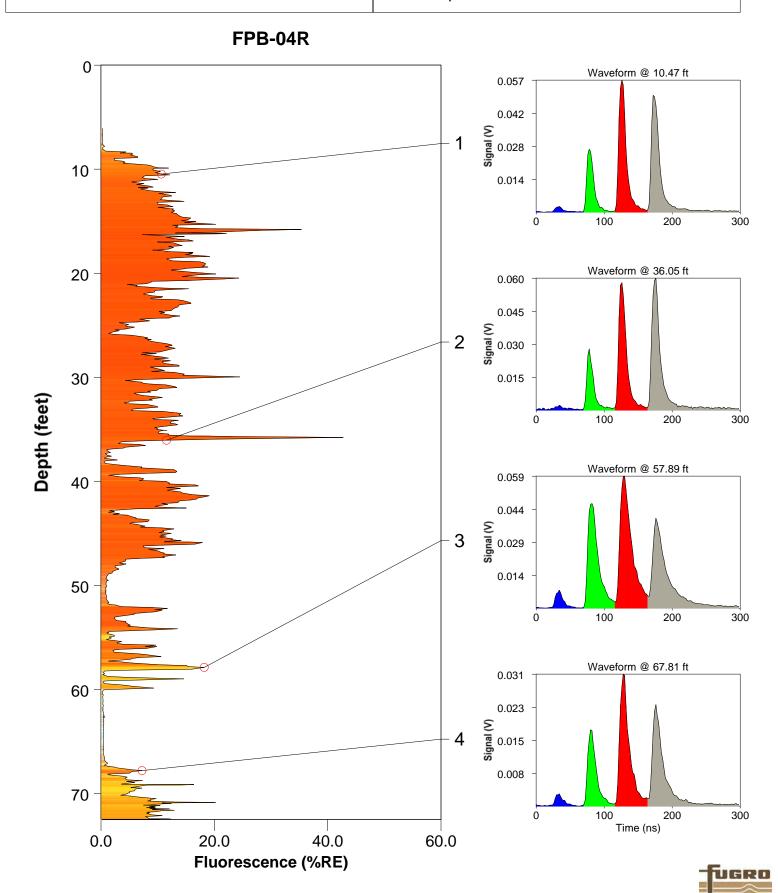
ROST Unit: 1

Operator: M. Parras

Fugro Job #: 04.0909-0040

Max fluorescence: 42.73% @ 35.78 ft

Final depth BGS: 109.26 ft



Site: Santa Fe Springs, CA

Client: ARCADIS

Date/Time: 7/24/2009 @ 10:21:25 AM

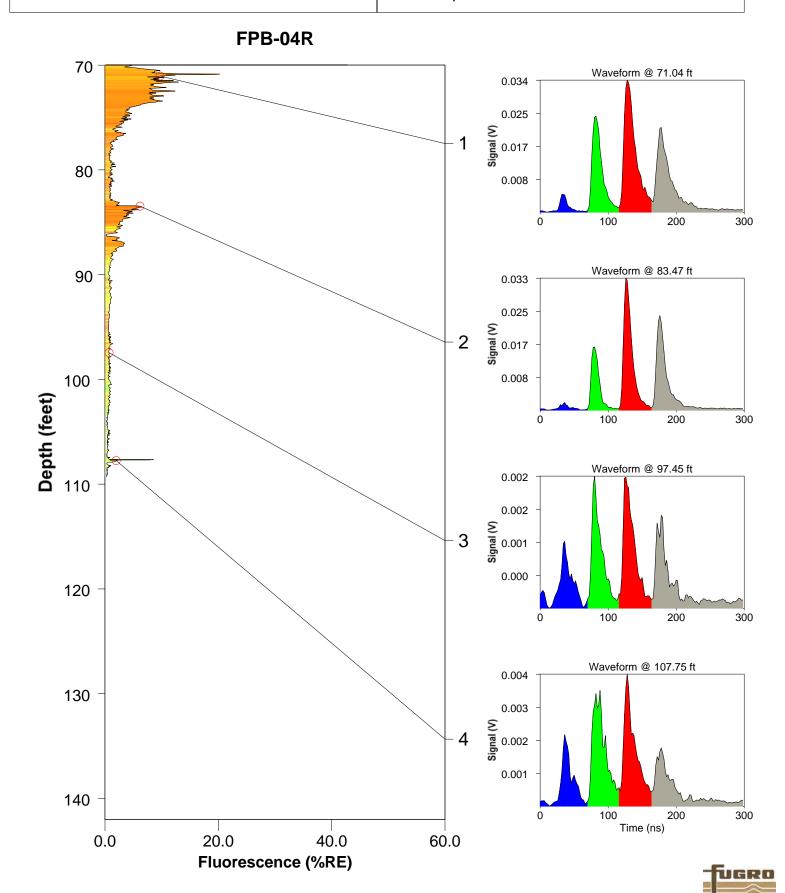
ROST Unit: 1

Operator: M. Parras

Fugro Job #: 04.0909-0040

Max fluorescence: 42.73% @ 35.78 ft

Final depth BGS: 109.26 ft



Site: Former CENCO Refinery

Client: ARCADIS BBL

Date/Time: 2/21/2008 @ 8:17:57 AM

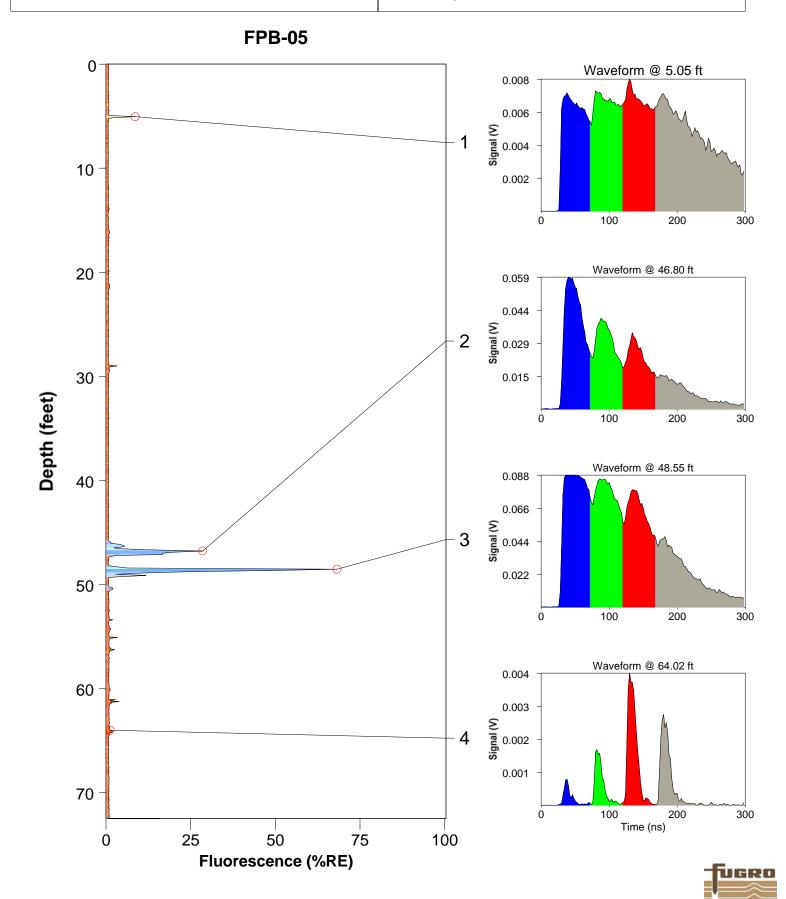
ROST Unit: 1

Operator: MITCH

Fugro Job #: 04.0908-0011

Max fluorescence: 67.83% @ 48.55 ft

Final depth BGS: 100.71 ft



Site: Former CENCO Refinery

Client: ARCADIS BBL

Date/Time: 2/21/2008 @ 8:17:57 AM

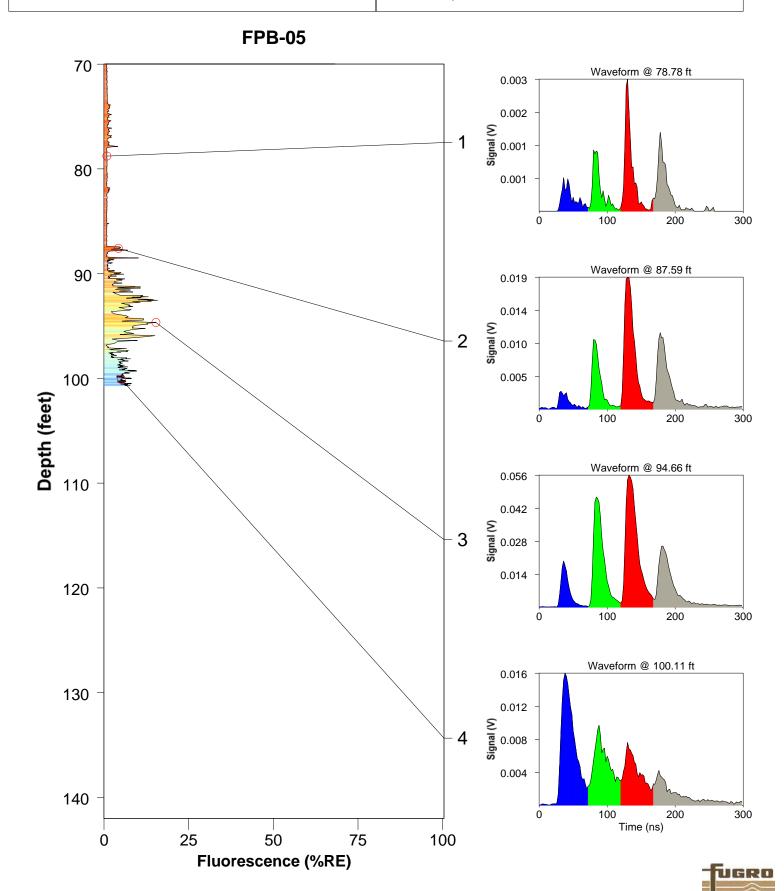
ROST Unit: 1

Operator: MITCH

Fugro Job #: 04.0908-0011

Max fluorescence: 67.83% @ 48.55 ft

Final depth BGS: 100.71 ft



Site: Santa Fe Springs, CA

Client: ARCADIS

Date/Time: 7/23/2009 @ 3:10:53 PM

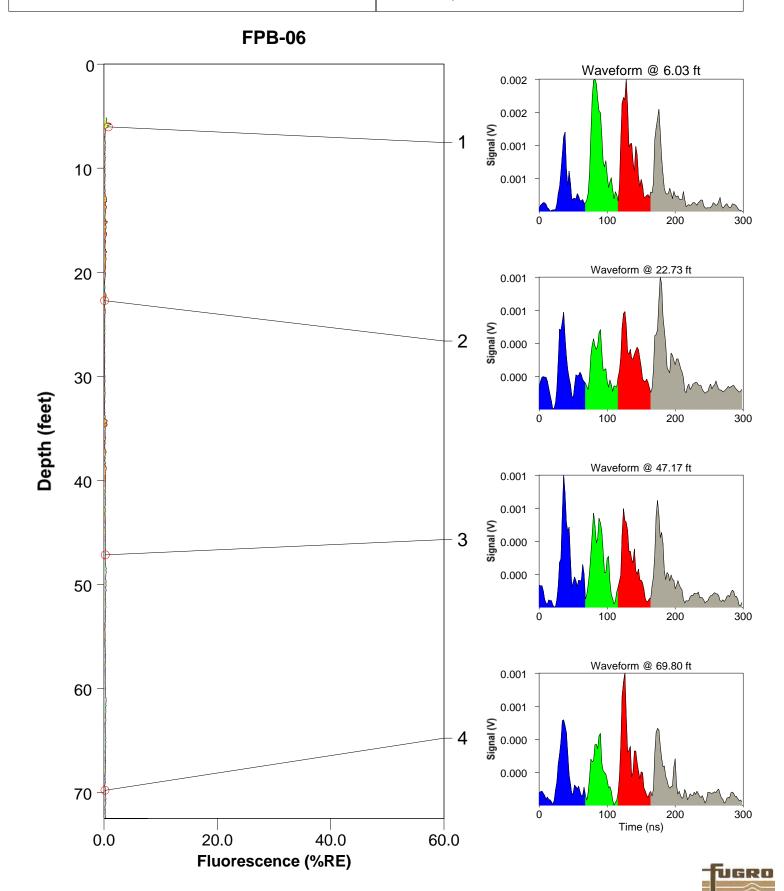
ROST Unit: 1

Operator: M. Parras

Fugro Job #: 04.0909-0040

Max fluorescence: 7.79% @ 93.24 ft

Final depth BGS: 103.02 ft



Site: Santa Fe Springs, CA

Client: ARCADIS

Date/Time: 7/23/2009 @ 3:10:53 PM

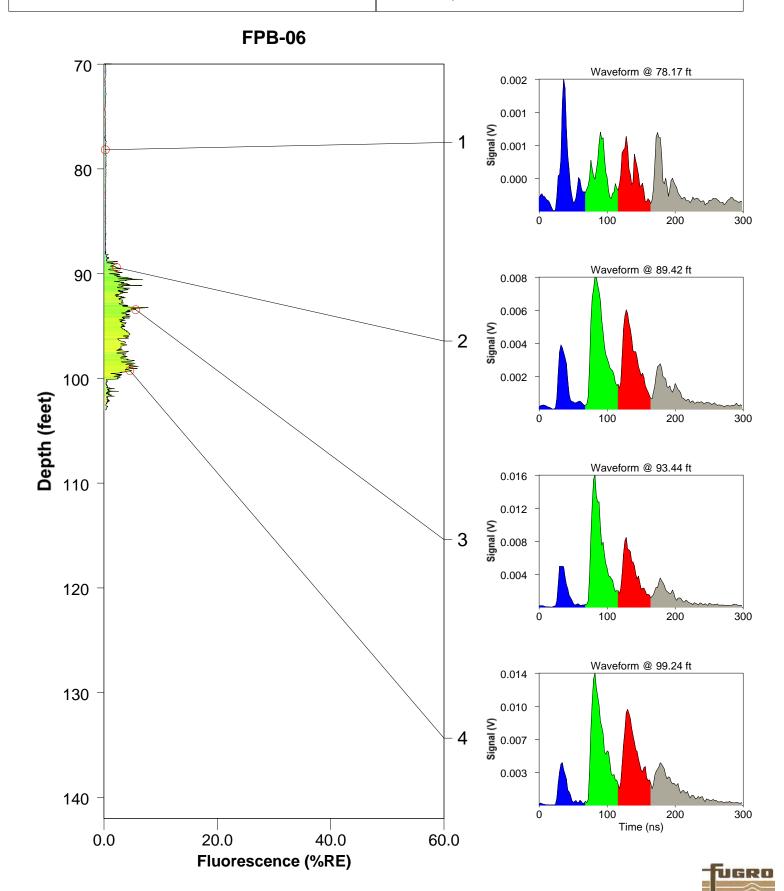
ROST Unit: 1

Operator: M. Parras

Fugro Job #: 04.0909-0040

Max fluorescence: 7.79% @ 93.24 ft

Final depth BGS: 103.02 ft



Site: Former CENCO Refinery

Client: ARCADIS BBL

Date/Time: 2/21/2008 @ 2:19:19 PM

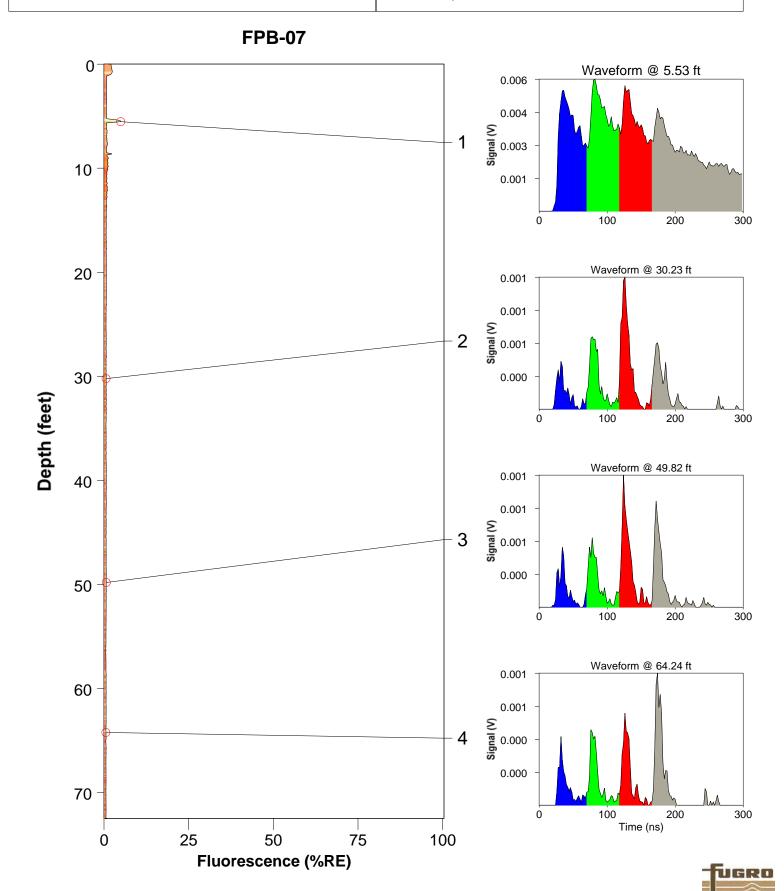
ROST Unit: 1

Operator: MITCH

Fugro Job #: 04.0908-0011

Max fluorescence: 4.55% @ 5.53 ft

Final depth BGS: 100.01 ft



Site: Former CENCO Refinery

Client: ARCADIS BBL

Date/Time: 2/21/2008 @ 2:19:19 PM

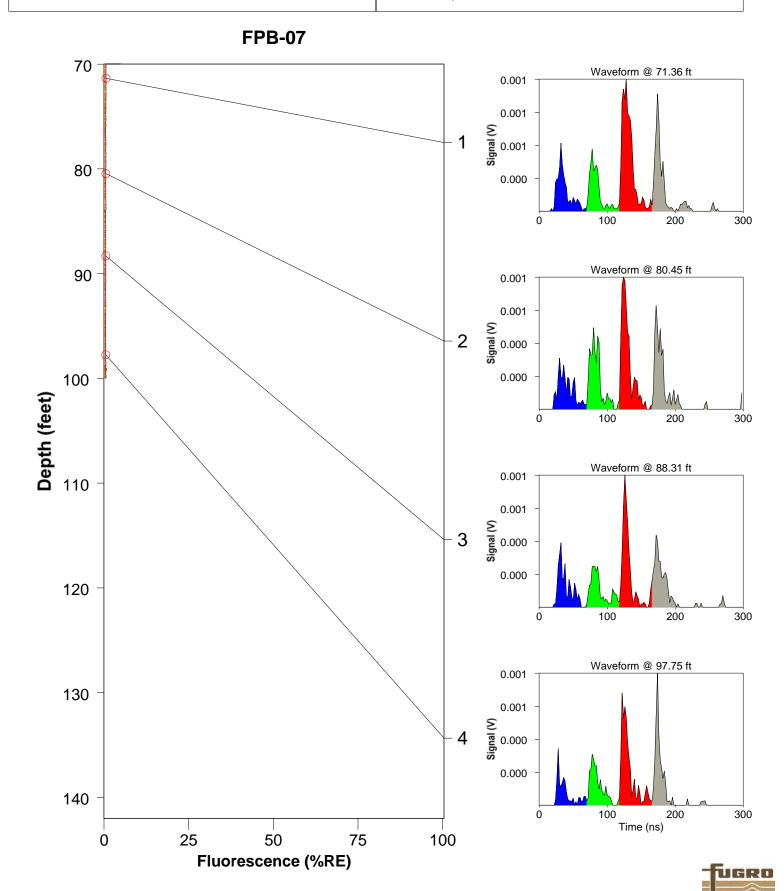
ROST Unit: 1

Operator: MITCH

Fugro Job #: 04.0908-0011

Max fluorescence: 4.55% @ 5.53 ft

Final depth BGS: 100.01 ft



CPT Data

Job Number 04.0909-0040

Robertson et al. 1986 * Overconsolidated or Cemented

CPT Number FPB-08R Location

Santa Fe Springs-CA

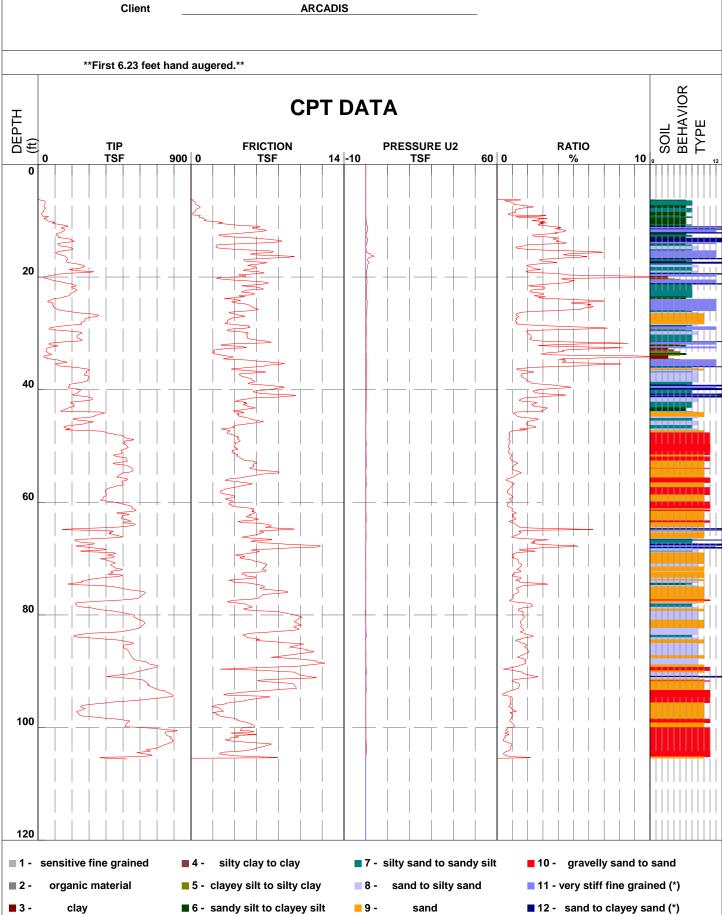
Operator

M. Parras

Date and Tim 24-Jul-2009 14:11:26

ARCADIS

Cone Number F7.5CKE2HAW21165



Site: Santa Fe Springs, CA

Client: ARCADIS

Date/Time: 7/23/2009 @ 10:51:54 AM

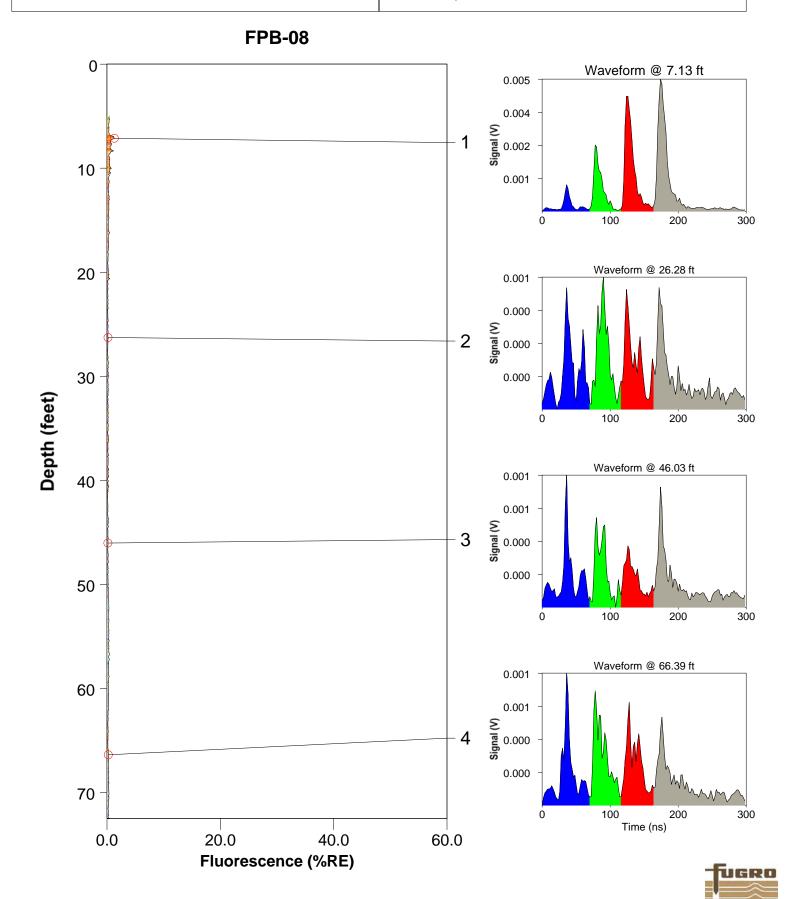
ROST Unit: 1

Operator: M. Parras

Fugro Job #: 04.0909-0040

Max fluorescence: 1.31% @ 7.13 ft

Final depth BGS: 100.05 ft



Site: Santa Fe Springs, CA

Client: ARCADIS

Date/Time: 7/23/2009 @ 10:51:54 AM

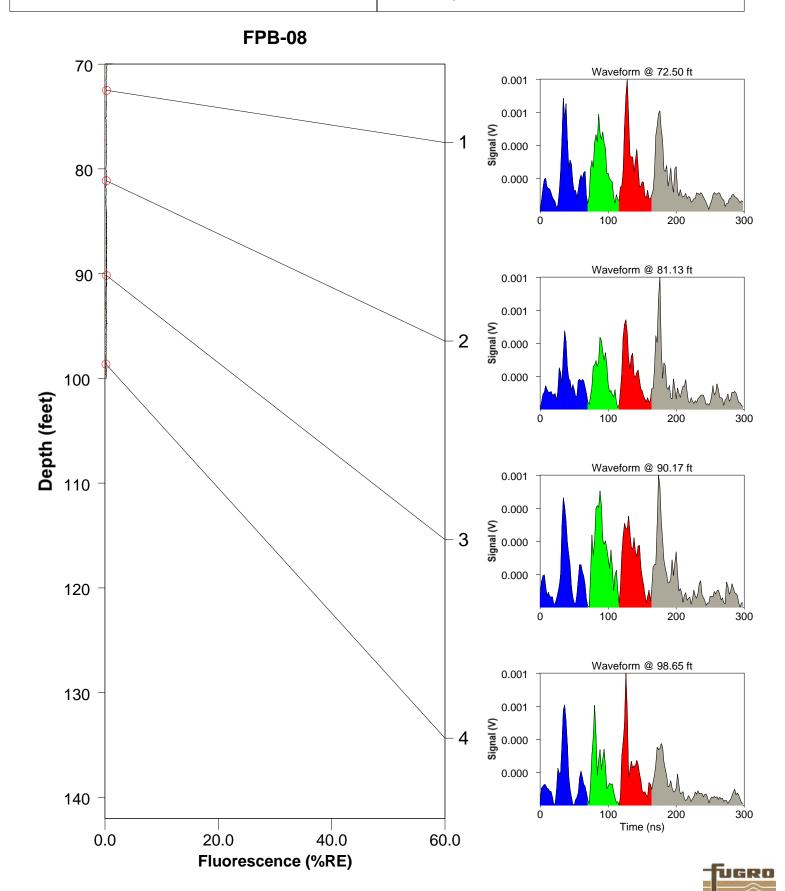
ROST Unit: 1

Operator: M. Parras

Fugro Job #: 04.0909-0040

Max fluorescence: 1.31% @ 7.13 ft

Final depth BGS: 100.05 ft



Site: Cenco Ref. Santa Fe Springs, CA

Client: Murex Env., Inc.

Date/Time: 3/29/2011 @ 12:14:40 PM

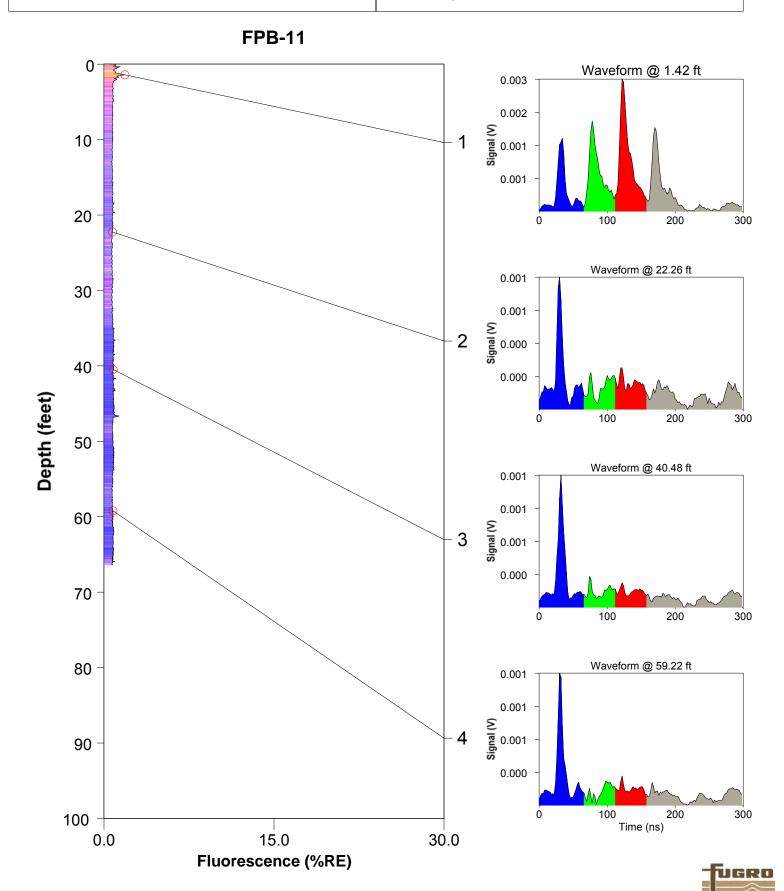
ROST Unit: III

Operator: Daniel Garza

Fugro Job #: 04.0911-0010

Max fluorescence: 1.84% @ 1.42 ft

Final depth BGS: 66.42 ft



Site: Cenco Ref. Santa Fe Springs, CA

Client: Murex Env., Inc.

Date/Time: 3/29/2011 @ 2:30:57 PM

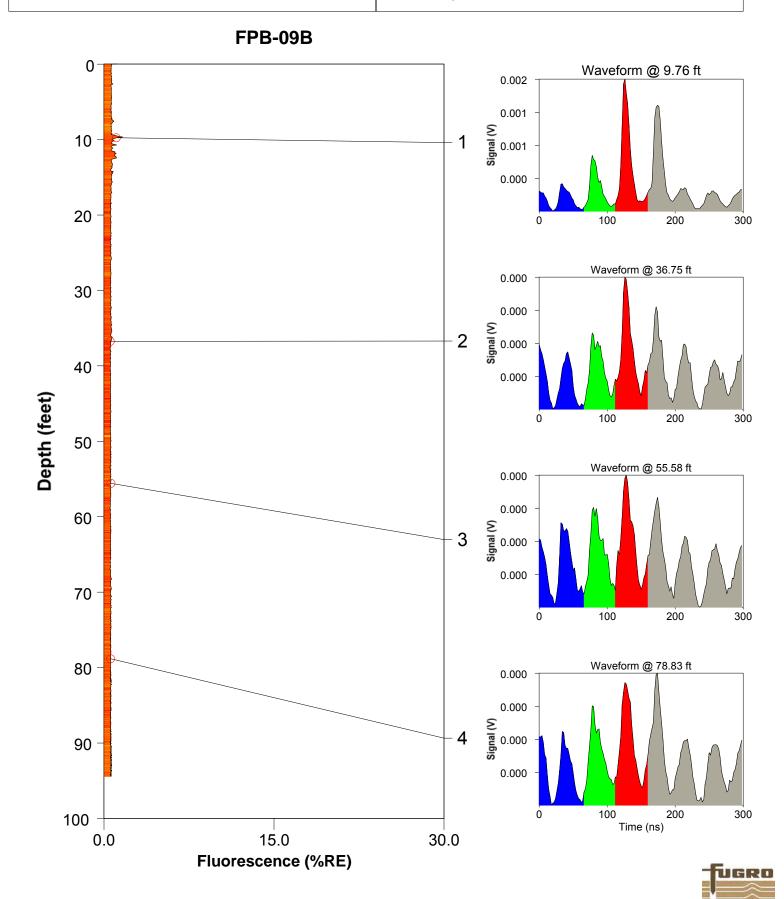
ROST Unit: III

Operator: Daniel Garza

Fugro Job #: 04.0911-0010

Max fluorescence: 1.63% @ 9.67 ft

Final depth BGS: 94.43 ft



Site: Cenco Ref. Santa Fe Springs, CA

Client: Murex Env., Inc.

Date/Time: 3/29/2011 @ 9:25:15 AM

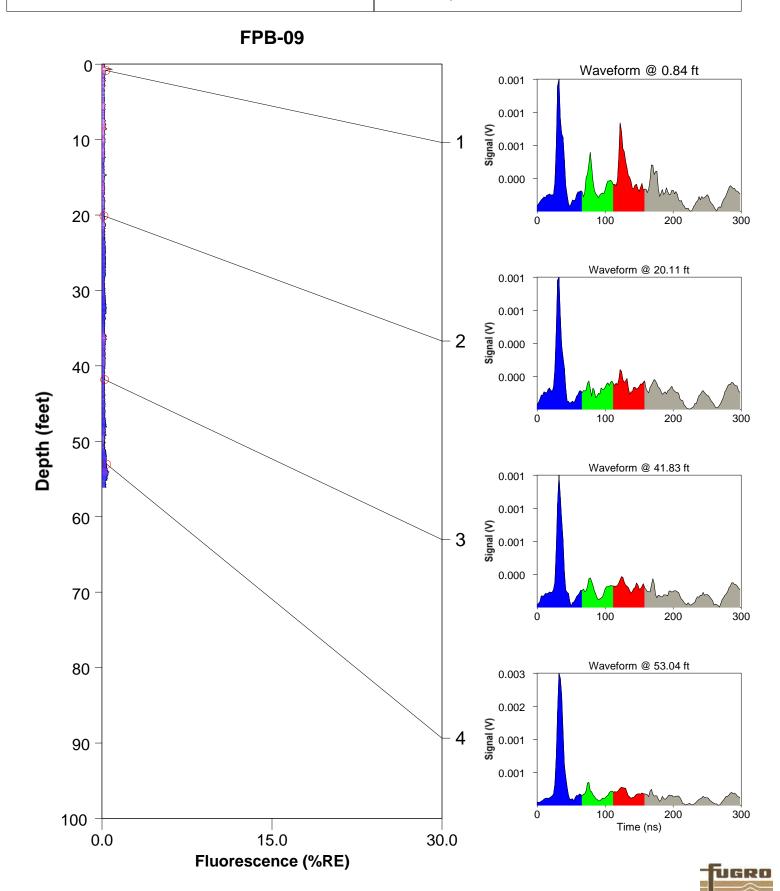
ROST Unit: III

Operator: Daniel Garza

Fugro Job #: 04.09110010

Max fluorescence: 0.92% @ 0.67 ft

Final depth BGS: 56.12 ft



Site: Cenco Ref. Santa Fe Springs, CA

Client: Murex Env., Inc.

Date/Time: 3/29/2011 @ 12:59:11 PM

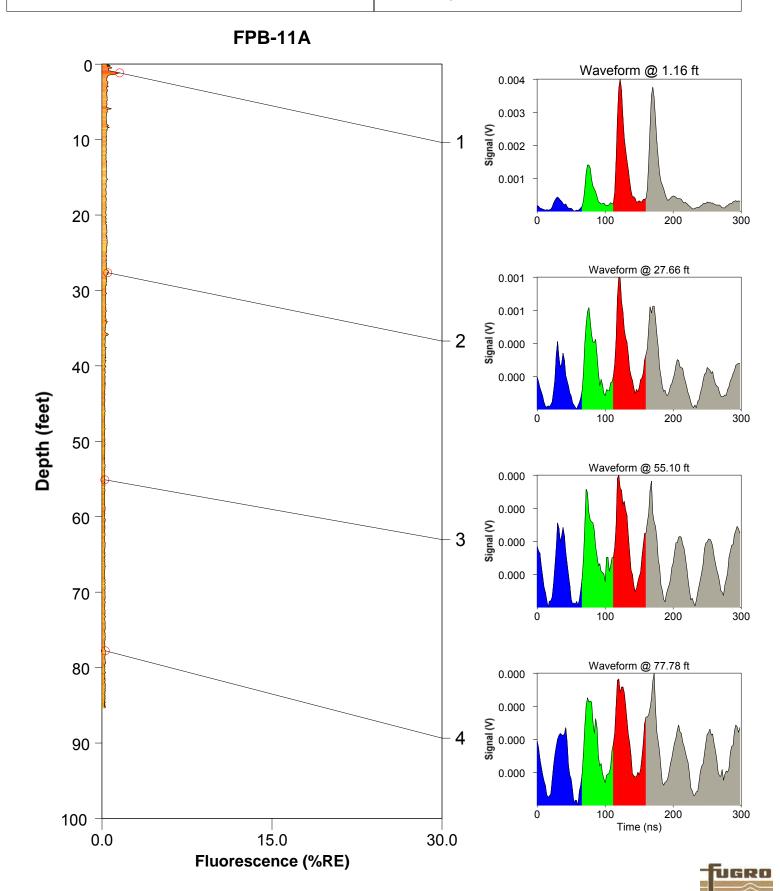
ROST Unit: III

Operator: Daniel Garza

Fugro Job #: 04.0911-0010

Max fluorescence: 1.55% @ 1.16 ft

Final depth BGS: 85.36 ft



Site: Santa Fe Springs, CA

Client: ARCADIS

Date/Time: 7/22/2009 @ 10:53:52 AM

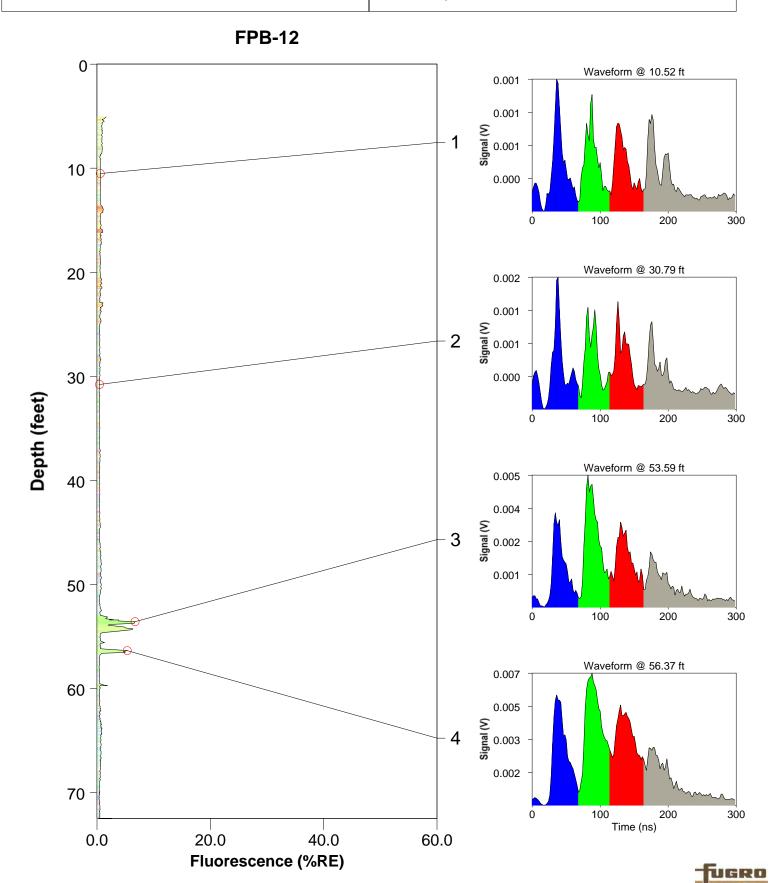
ROST Unit: 1

Operator: M. Parras

Fugro Job #: 04.0909-0040

Max fluorescence: 6.72% @ 53.59 ft

Final depth BGS: 91.04 ft



Site: Santa Fe Springs, CA

Client: ARCADIS

Date/Time: 7/22/2009 @ 10:53:52 AM

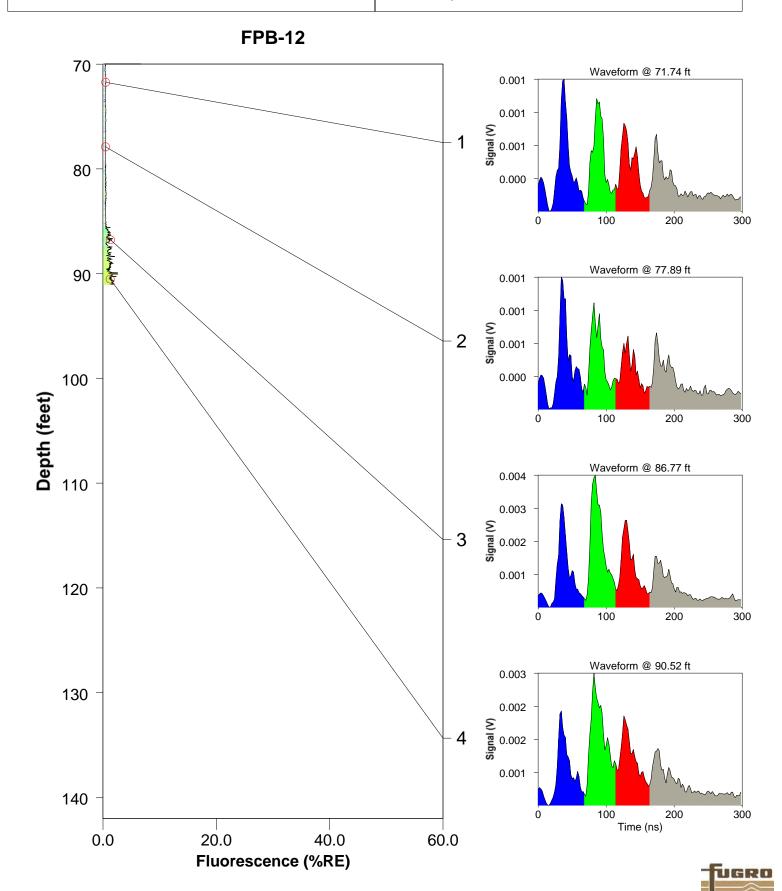
ROST Unit: 1

Operator: M. Parras

Fugro Job #: 04.0909-0040

Max fluorescence: 6.72% @ 53.59 ft

Final depth BGS: 91.04 ft



Site: Santa Fe Springs, CA

Client: ARCADIS

Date/Time: 7/24/2009 @ 7:56:08 AM

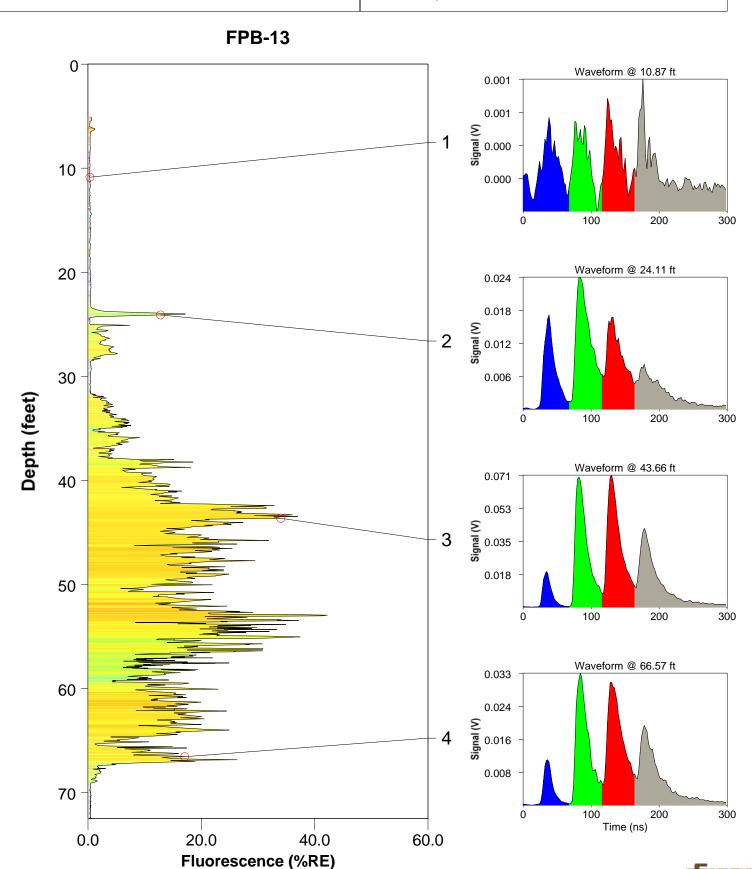
ROST Unit: 1

Operator: M, Parras

Fugro Job #: 04.0909-0040

Max fluorescence: 42.21% @ 52.97 ft

Final depth BGS: 102.23 ft



Site: Santa Fe Springs, CA

Client: ARCADIS

Date/Time: 7/24/2009 @ 7:56:08 AM

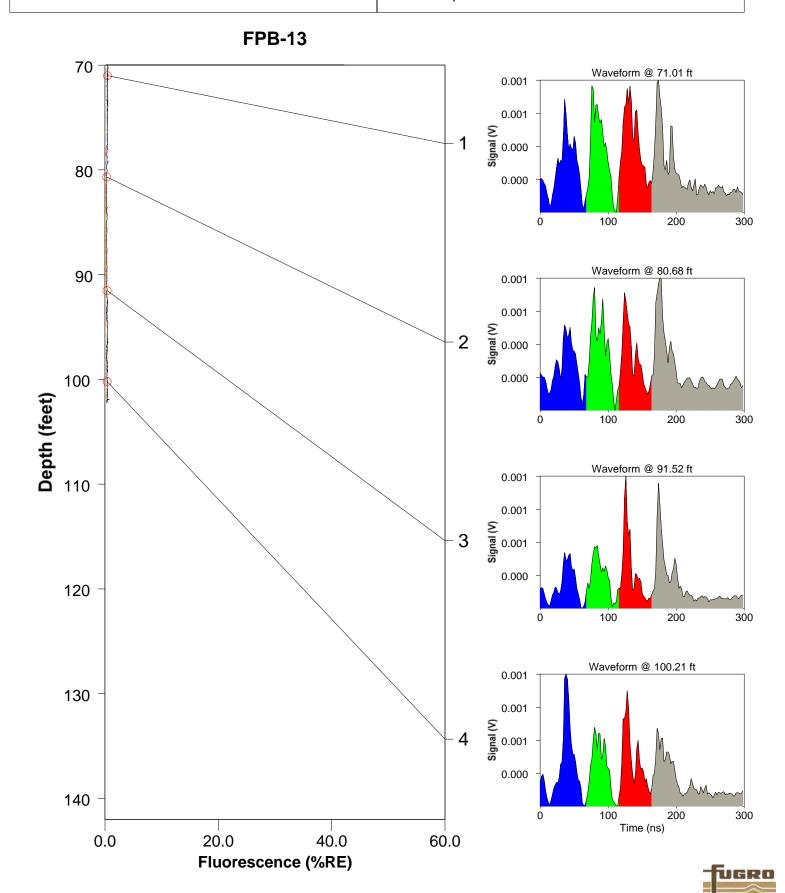
ROST Unit: 1

Operator: M, Parras

Fugro Job #: 04.0909-0040

Max fluorescence: 42.21% @ 52.97 ft

Final depth BGS: 102.23 ft



Site: Cenco Ref. Santa Fe Springs, CA

Client: Murex Env., Inc.

Date/Time: 3/29/2011 @ 4:44:39 PM

ROST Unit: III

Operator: Daniel Garza

Fugro Job #: 04.0911-0010

Max fluorescence: 1.52% @ 26.48 ft

Final depth BGS: 79.45 ft

